BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 23 1946

EXPULSION OF PATHOGENIC ORGANISMS FROM THE RESPIRATORY TRACT

BY

J. P. DUGUID, M.B., B.Sc.

(From the Department of Bacteriology, Edinburgh University)

The role of droplet spray in the transmission of infective diseases of the respiratory tract is not yet fully understood. Modern methods of observation have revealed that very large numbers of droplets are expelled during sneezing, coughing, and speaking, and that most of these are small enough to remain air-borne as "droplet nuclei" (Wells, 1935; Bourdillon, Lidwell, and Lovelock, 1942; Jennison, 1942; Duguid, 1945, 1946). Droplet nuclei (Wells, 1934) are the solid residues of those respiratory droplets which are small enough (less than about 100 microns in diameter) to evaporate completely before falling to the ground; after their formation they are capable of remaining air-borne for some minutes or for some hours, and of travelling long distances inside buildings. The demonstration that many such droplet nuclei are produced during expiratory activities has made it appear likely that air infection by droplet spray plays a part of major importance in the transmission of infection (see Wells and Wells, 1936). It has been found, however, by those who have investigated the expulsion of pathogenic organisms by infected persons that aerial infection is much more limited than is suggested by the purely physical studies of droplet spray, and that the pathogenic organisms of the respiratory tract (e.g., haemolytic streptococci and tubercle bacilli) are not expelled as readily or in as great numbers as the commensal organisms from a normal mouth or an indicator organism (e.g., *S. marcescens*) from an artificially infected mouth.

Bloomfield and Felty (1924), examining four patients with acute streptococcal tonsillitis, exposed blood-agar plates 3 to 12 in. (7.5 to 30 cm.) in front of the mouth during *speaking*, *coughing*, and *sneezing* for one-minute periods; droplets containing haemolytic steptococci were expelled by only one of the four patients, a few during coughing and a few during sneezing. In observations carried out in a similar manner during *coughing* by throat carriers, droplets containing haemolytic streptococci were found to be expelled in only 1 out of 9 tests on five carriers (Colebrook, 1933), and by only 4 out of 14 carriers (Paine, 1935). Hare (1940) examined 12 throat carriers of haemolytic streptococci, exposing five blood-agar plates in a quarter-circle in front of and below the mouth, at a distance of one foot from it; a few droplets containing haemolytic streptococci, comprising from 0.3 to 3.5% of the droplets recorded, were found to be expelled in 8 out of 37 tests of *coughing six times* (in all, 11 infected droplets), and in 15 out of 47 tests of *speaking for one minute* (in all, 27 infected droplets). It appeared that the infected droplets were too large to remain air-borne as droplet nuclei; no droplet nuclei containing haemolytic streptococci were recovered by the Wells air-centrifuge from the air in front of the mouth in any of seven tests of *speaking* by five carriers. The production of some infected droplet nuclei during *sneezing* was demonstrated in subsequent tests (Hare, 1945). However, Hare does not believe that direct infection of the air with droplet nuclei plays any important part in the transmission of infection. He suggests that infection is spread through the air mainly by infected dust particles liberated from clothing, bedding, and room furnishings, after these have been soiled by the *large* infected droplets which fall out of the air within a few seconds of their emission. This view is supported by the findings of several investigators who have observed that numerous haemolytic streptococci may be present on the skin, clothes, and bedding of infected persons, and in the dust of rooms which they occupy, and also that these haemolytic streptococci are stirred up into the air in large numbers during sweeping, bed-making, and body movement (White, 1936; Brown and Allison, 1937; van den Ende, Lush, and Edward, 1940; Hare, 1941; Thomas and van den Ende, 1941; Thomas, 1941; Cruickshank, 1941; Wright, Cruickshank, and Gunn, 1944; Hamburger, Puck, Hamburger, and Johnson, 1944; Edward, 1944; Hamburger, Green, and Hamburger, 1945).

Tubercle Bacilli

The expulsion of tubercle bacilli during coughing by patients with open pulmonary tuberculosis has been demonstrated frequently; the infected droplets are caught on slides held in front of the mouth and are examined microscopically. Goldie (see Winslow and Robinson, 1910; Chapin, 1912) found that tubercle bacilli were expelled at one time or another by every patient examined, and on 14% of occasions when only a single cough was given. Ziesché (1907) made 61 examinations on 22 patients with open pulmonary tuberculosis, holding a 324-sq.-cm. glass plate 40 to 80 cm. in front of the mouth for 30 minutes during *natural coughing*; tubercle bacilli were expelled by 13% of the patients at the first examination and by 79% of the patients who were examined frequently; in 29 out of 61 tests tubercle bacilli were found on the exposed plate—less than 10 bacilli in three cases, between 10 and 100 in fifteen cases, between 100 and 1,000 in nine cases, 1,445 in one case, and 20,174 in one case. It appears that very few, if any, of the expelled droplets which contain tubercle bacilli are small enough to remain air-borne as droplet nuclei. Laschtschenko (1899) carried out five tests, in each of which a patient with open pulmonary tuberculosis, coughing naturally at intervals, sat in a small chamber for five hours while 10 cubic metres of air from the chamber were examined by filtration; air-borne tubercle bacilli were demonstrated in only two out of the five tests. Heymann (1901) carried out similar tests, each of one hour's duration; in most of these no air-borne tubercle bacilli were demonstrated, but on one occasion virulent tubercle bacilli were recovered from the air more than 30 minutes after the patient had left the chamber. The positive results obtained in these tests must be interpreted with caution, for they may as well have been due to infected dust particles liberated from the clothing of the patient as to infected droplet nuclei. Raising of infected dust seems the most likely cause of air infection, for tubercle bacilli have commonly been found in the dust of dwelling-places occupied by persons with open pulmonary tuberculosis (e.g., Cornet, 1889).

Organisms affecting the Respiratory Tract

Little appears to be known about the expulsion by infected persons of droplets containing such organisms as *C. diphtheriae*, *N. intracellularis*, *H. influenzae*, *Dip. pneumoniae*, *Staph. aureus*, and the viruses of acute coryza, influenza, measles, smallpox, and other diseases affecting the respiratory tract (see Hare, 1945). There is, however, some evidence which suggests that certain of these pathogenic organisms may commonly be spread by infected dust. Crosbie and Wright (1941) found that virulent diphtheria bacilli were present in large numbers in the floor dust of diphtheria wards, that these bacilli remained viable in the dust for some months, and that they were stirred up into the air by sweeping; Avery and his colleagues (1917) and Stillman (1917) demonstrated the presence of viable pneumococci in room dust; and Edward (1941) showed that the influenza virus could remain viable in dust for some days or weeks.

In the absence of sufficient information, gained by direct observation, of the number of infected droplets which may be expelled by persons with such respiratory infections, it has been customary to assess the likelihood of infected droplet-spray production, and of subsequent air-borne infection, from the observed frequency of *throat carriage* of the pathogenic organisms concerned. During respiratory tract disease caused by infection with *Str. pyogenes*, *Dip. pneumoniae*, *C. diphtheriae*, *N. intracellularis*, *H. influenzae*, and

Staph. aureus, or with certain viruses, the causal organisms are usually present, often in very large numbers, in the secretions of the tonsillar and nasopharyngeal regions. Moreover, apart from cases of actual disease, pathogenic organisms of many species may be carried in the throats of healthy persons—carriers—who form a considerable proportion, often from 1 to 10%, of the normal population. Droplet spray does not, however, originate readily from the tonsillar and nasopharyngeal regions. Jennison (1942), discussing the mechanism of droplet formation, argues that most droplets must originate from the secretions at the front of the mouth, except in the case of coughing with the mouth kept well open, when the zone of greatest droplet formation may be in the pharyngeal region. Photographic studies of droplet spray have shown that, in sneezing, droplets may be emitted from the nose as well as from the mouth; such nasal discharge is, however, usually much scantier than the oral discharge, more infrequent, and often made up of large masses of secretion rather than of discrete droplets (Bourdillon and Lidwell, 1941; Jennison, 1942). In a study (Duguid, 1945) of the numbers of droplets expelled during various expiratory activities the site of droplet origin was observed by use of an indicator organism, *S. marcescens*; it was found that most of the expelled droplets originated from the anterior mouth (about the lips, front teeth, and tip of tongue), and that only a few, perhaps between 0.01 and 1%, originated directly from the faucial region during *coughing* and *sneezing*, and from the nose during *sneezing* and *normal breathing*. Not many of these scanty nasal and faucial droplets were small enough to remain air-borne as droplet nuclei.

The production of air-borne infection with *droplet nuclei* must therefore depend mainly upon the presence of pathogenic organisms in the saliva of the anterior mouth. Faucial and nasal carriage may, on the other hand, be of much greater importance with regard to the production of air infection with *infected dust particles*: pathogenic organisms may be expelled from the nose or from the throat in masses of secretion or in large droplets and so give rise to infected dust. Bloomfield and Felty (1924) showed that, in contrast to the slight dissemination of infection in droplet spray, large numbers of haemolytic streptococci were emitted from the throat of an infected person in expectorated "hawkings." Recently Hamburger, Green, and Hamburger (1945) have shown that haemolytic streptococci are dispersed much more readily from the nose than from the throat. In an examination of 400 patients with haemolytic streptococcal infection of the upper respiratory tract it was found that about 80 times as many haemolytic streptococci were expelled on to the bedclothes by patients with *strongly positive nasal cultures* as by patients with positive throat cultures but negative nose cultures. The haemolytic streptococcal content of the air of a ward containing patients with positive nasal cultures was about 35 times as high as that of the air of a ward containing patients with only the throat cultures positive. Of 12 traced hospital cross-infections 11 originated from patients with positive nasal cultures.

It appears, then, that the danger of air-borne infection should be assessed not in terms of the occurrence of *throat carriage* of pathogenic organisms but in terms of the occurrence of *oral carriage* and *nasal carriage*. Moreover, infection of the nasal cavity and of the anterior mouth does not occur in regular association with infection of the throat. Pathogenic organisms may be disseminated forward from the throat during sneezing, coughing, hawking, and speaking, but the resulting infection is limited in duration by the action of eliminative mechanisms present in the mouth and in the healthy nose. Bloomfield (1921, 1922) showed that pathogenic organisms carried in the upper respiratory tract were for the most part confined to certain circumscribed localities, especially to the tonsils and pharynx; he described the presence in the mouth of a rapidly acting eliminative mechanism whereby bacteria are swept back to the pharynx in the salivary stream. Appleton and his colleagues (1938, 1944) found that the time required for the elimination of foreign organisms from the mouth varied (e.g., from 1/2 to 8 hours) with the numbers of organisms introduced, and that elimination was accelerated by increase of salivation. The removal of bacteria from the mouth appeared to be brought about mainly by the mechanical flushing action of the saliva and perhaps partly by a direct antibacterial action, ascribable to lysozyme activity, to sulphocyanate content, or to the antibiotic action of the normal salivary flora. An antibacterial action of the saliva has been described in the case of the diphtheria bacillus by Bézi (1932), by Dold and Weigmann (1935), and by Casassa (1937); in the case of the tubercle bacillus by Kanter and Appleton (1940); and in the case of the meningococcus by Gordon (1916). Elimination of bacteria from the nasal cavity appears to be effected similarly (in from 1/2 to 24 hours) by the backward current of the cilia-motivated mucus film and perhaps partly by a bactericidal action, as by lysozyme (Bloomfield, 1919; Arnold, Ostrom, and Singer, 1928).

Oral Carriage and Nasal Carriage

Few studies have been made of the oral carriage of pathogenic organisms; moreover, most of those published refer to the oral cavity as a whole and not to the anterior mouth alone; their significance with regard to air infection is therefore difficult to assess. Oral carriage of haemolytic streptococci was found in 12% of examinations of healthy persons (Min. Hlth. Rep., 1930) and in 40 to 70% of examinations of throat carriers (Hare, 1940; Hamburger, 1944). Nasal carriage of haemolytic streptococci has been found with about one-quarter the frequency of throat carriage, in 0.05 to 5% of healthy persons (Min. Hlth. Rep., 1930, 1939; Peacock, Bigler, and Werner, 1939; Williams and Harper, 1944; Hamburger, Green, and Hamburger, 1945). Nasal infection has been found in from one-third to two-thirds of patients with acute streptococcal infection of the upper respiratory tract (De Waal, 1940; Hamburger, Green, and Hamburger, 1945).

Oral infection with diphtheria bacilli has been observed occasionally; a few published cases are quoted by Appleton (1944), and Reiche (1915) found labial lesions in 49 out of 7,314 fatal cases of diphtheria. The presence of diphtheria bacilli in the nose is much more common, occurring in healthy carriers, in cases of nasal diphtheria, and in a proportion of cases of faucial diphtheria: Boissard and Fry (1941, 1942) found diphtheria bacilli in nasal swabs from 19 out of 231 normal children examined at the time of an epidemic, and in nasal swabs from more than a third of 388 patients with faucial diphtheria.

Appleton (1944) has reviewed studies of the occurrence of tubercle bacilli in the mouth. Tuberculosis of the oral cavity has been found only rarely—in 127 out of 67,000 tuberculosis necropsies. Tubercle bacilli have been found frequently, however, in the mouths of patients with open pulmonary tuberculosis: for instance, in the mouths of 10 out of 20 patients by Gloyne (1922), and on the lips of patients by Gulbrandsen and Keller (1935).

The amount of infection disseminated in droplet spray is determined not only by the frequency of the occurrence of pathogenic organisms at the sites of droplet-spray formation but also by the numbers of these organisms present in the secretions at such places. Hamburger (1944), examining 554 samples of saliva from 156 persons with infected throats, found that the numbers of haemolytic streptococci in the different samples varied from 100 to 5,000,000 per millilitre, being in most cases between 1,000 and 1,000,000 per millilitre. On the basis of an observed droplet size-distribution, it has been calculated (Duguid, 1946) that of 5,000 droplets expelled by a cough only about 230 (4.6%) and 6 (0.1%) would be likely to contain pathogenic organisms when, respectively, 1,000,000 and 1,000 of these were present per millilitre of the secretions atomized. The number of infected droplets small enough to remain air-borne as droplet nuclei was calculated to be about 60 in the former case and 0 in the latter.

The present investigation was carried out in an effort to ascertain whether the expulsion of infected droplets depends upon the existence of pathogenic organisms in the secretions of the anterior mouth; this had appeared probable, as the great majority of droplets originate from the front of the mouth. Although the results of the investigation were to some extent inconclusive with regard to this question, it is considered that it may be of value to record them, for published observations of the expulsion of pathogenic organisms in droplet spray have been few and not very extensive.

Experimental

Three groups of infected persons were examined: 87 persons with haemolytic streptococci present in the throat, including 50 scarlet fever patients and 37 throat carriers; 50 faucial diphtheria patients with positive throat cultures; and 20 patients with pulmonary tuberculosis, in whose sputum tubercle bacilli had been demonstrated.

The mouth-spray droplets expelled by each person during a series of six voluntarily produced coughs were collected on a culture plate or microscope slide held about 3 in. (7.5 cm.) in front of the mouth. (Only the larger droplets would be collected by this method, which depends upon direct impingement. However, most of the pathogenic organisms expelled are contained in the large droplets. The majority of those expelled would be collected on the culture plates, as these had an area (about 12 sq. in.: 77 sq. cm.) at least as great as the likely area of spread of the droplets at 3 in. (7.5 cm.) from the mouth. A smaller proportion would be collected on the microscope slides, which had only one-quarter of this area (3 sq. in.: 19 sq. cm.). *Subsequent statements as to the numbers of infected droplets found to be expelled are subject to these limitations of the technique.*)

In the case of haemolytic streptococcal infections blood-agar plates were exposed; in the case of diphtheria, Hoyle tellurite plates; and in the case of pulmonary tuberculosis, microscope slides which had been warmed to prevent condensation from the breath obscuring the outlines of the droplet marks. After aerobic incubation for 24 hours the beta-haemolytic colonies on the blood-agar plates were counted; a separate count was also made of all the other colonies

present. Some of the beta-haemolytic colonies on each plate were subcultured in 5% serum broth and tested for soluble haemolysin production against sheep red cells; only those which produced soluble haemolysin were recorded as haemolytic streptococci. After incubation for 48 hours a count was made of those colonies on the Hoyle plates which had the appearance of diphtheria bacillus colonies; a separate count was also made of all the other colonies present. Some of the colonies on each plate were subcultured and their fermentation reactions tested; those which fermented glucose but not sucrose were recorded as diphtheria bacilli. The microscope slides which had been exposed to the coughing of the tuberculous patients were stained by the Ziehl-Neelsen method. Each slide was searched systematically for droplet marks under the low power of the microscope; the droplet marks were measured with the aid of a micrometer eyepiece and were searched for tubercle bacilli under oil immersion. The total number of droplets encountered on each slide, the number of droplets containing tubercle bacilli, and the number of tubercle bacilli in each droplet were recorded.

Before each test of coughing, and also after it for the tuberculous cases, swabs were taken from the throat (the surfaces of both tonsils and of the adjoining parts) and from the anterior mouth (the inner surfaces of the lips, the inner and outer surfaces of the front teeth and gums, and the tip of the tongue). In the examinations for haemolytic streptococci and diphtheria bacilli the swabs were plated on blood-agar plates and Hoyle plates respectively; the colonies were identified in the manner described for the cough-plate colonies, and their numbers were noted. In examinations for tubercle bacilli the swabs were first treated with acid by the method of Nassau (1941), and each was then rubbed on the surface of two Löwenstein egg-medium slopes; these slopes were examined at intervals during four weeks of incubation for growth of *M. tuberculosis* colonies, and the number of these colonies was noted.

Results

During a series of six coughs, droplets containing haemolytic streptococci were found to be expelled by 39 out of 87 persons with infected throats; between 1 and 10 infected droplets were expelled in 27 cases, between 10 and 100 in nine cases, and between 100 and 400 in the other three cases. In all, 1,109 infected droplets were expelled during 522 coughs—that is, about two infected droplets for each cough. As would be expected, the greatest numbers of infected droplets were generally expelled by the coughs which were the most forceful and which produced most droplet spray. Of all the droplets expelled by the 87 patients those containing haemolytic streptococci comprised only 10%. The proportion of droplets infected, however, varied greatly from case to case—between 0 and 80%. Haemolytic streptococci were found in the anterior-mouth secretions of 13 out of the 87 persons examined; the numbers of these were in six cases very small, in three cases moderate, and in only four cases comparable to the numbers found in the throat secretions. There was no apparent correlation between the expulsion of infected droplets and the presence of haemolytic streptococci in the anterior mouth. Infected droplets were expelled by 5 of the 13 patients with positive anterior-mouth cultures and by 34 of the 74 patients with negative anterior-mouth cultures; 63 infected and 720 non-infected droplets were expelled by the five patients with positive anterior-mouth cultures, and 1,046 infected and 7,500 non-infected droplets were expelled by the 34 patients with negative anterior-mouth cultures. This would suggest that some of the cough droplets, including most of the infected ones, must have originated directly from the throat. Such a conclusion, however, cannot be made with certainty, for it is possible that a few haemolytic streptococci were indeed present in the anterior-mouth secretions of those patients who gave negative anterior-mouth cultures, but that they were overgrown by the mouth commensal organisms in the heavily inoculated parts of the culture plates.

During a series of six coughs, droplets containing diphtheria bacilli were found to be expelled by 10 out of 50 patients with faucial diphtheria; only one infected droplet was expelled in five of these cases, two infected droplets in three cases, and, respectively, 10 and 27 infected droplets in the other two cases. In all, 48 infected droplets were expelled during 300 coughs—that is, about one infected droplet for every six coughs. The infected droplets comprised about 4% of all the droplets (which contained organisms cultivable on tellurite medium) found to be expelled by the 50 patients. Diphtheria bacilli were discovered in the anterior-mouth secretions of 12 out of the 50 patients; only very small numbers were present in 10 of these patients and moderate numbers in the other two. There was no complete correlation between the expulsion of infected droplets and the presence of diphtheria bacilli in the anterior mouth. Infected droplets were expelled by 6 of the 12 patients with positive anterior-mouth cultures (in all, 43 infected droplets) and by 4 of the 38 patients with negative anterior-mouth cultures (in all, 5 infected droplets).

Droplets containing tubercle bacilli were found to be expelled during a series of six coughs by 10 out of 20 patients with open pulmonary tuberculosis. In all, 410 droplets were found on the slides exposed to 120 coughs; 36 of these droplets were infected, 19 containing between 1 and 10 tubercle bacilli, 9 containing between 10 and 100, 3 containing between 100 and 1,000, 4 containing between 5,000 and 20,000, and 1 containing about 40,000. The bacilli were packed so closely in the five most heavily infected droplets that only a rough estimate could be made of their numbers. All of these 5 droplets and 10 other infected droplets in addition were produced by one patient, who must have expelled at least 80,000 tubercle bacilli during the six coughs. Much smaller numbers were expelled by the other patients: one was found to expel 200 tubercle bacilli (in one droplet), a second to expel 175 (in nine infected droplets), a third to expel 60 (in one droplet), a fourth to expel 13 (in three droplets), a fifth to expel 6 (in three droplets), and the other four patients each to expel only one or two tubercle bacilli in a single droplet. The stain-marks of the infected droplets ranged from 30 to 3,000 microns in diameter, nine being under 100 microns. It is probable, therefore, that some of the infected droplets were small enough to remain air-borne as droplet nuclei. None of these small droplets, however, contained more than a very few tubercle bacilli. In the examinations made before coughing, tubercle bacilli were found to be present in the secretions of the throat of 15 out of the 20 patients, and in the secretions of the anterior mouth of 10 of the 20 patients; in two other patients infection of the anterior mouth appeared subsequent to the coughing. The tubercle bacilli were usually numerous in the throat secretions (e.g., a few dozen to a few hundred colonies being obtained on the slopes), and they were usually scanty in the anterior-mouth secretions (e.g., a few to a few dozen colonies being present on the slopes). A positive throat culture was obtained from all of the 10 patients who expelled infected droplets, and a positive anterior-mouth culture from eight of these. No evidence, therefore, was obtained to suggest that infected material was atomized in the bronchi and expelled directly from there; formation of infected droplets probably occurred in the throat or in the anterior mouth, these localities having been soiled previously by sputum coughed up from the bronchi.

Summary

Droplets containing haemolytic streptococci were expelled during a series of six coughs by 39 out of 87 scarlet fever patients and throat carriers: 1,109 infected droplets were expelled during 522 coughs. Haemolytic streptococci, usually in small numbers, were found in the anterior-mouth secretions of 13 out of the 87 patients.

Droplets containing diphtheria bacilli were expelled during a series of six coughs by 10 out of 50 patients with faucial diphtheria: 48 infected droplets were expelled during 300 coughs. Diphtheria bacilli, usually in very small numbers, were found in the anterior-mouth secretions of 12 out of the 50 patients.

Droplets containing tubercle bacilli were expelled during a series of six coughs by 10 out of 20 patients with open pulmonary tuberculosis; out of 410 droplets collected during 120 coughs, 36 were found to contain tubercle bacilli in numbers varying from 1 to 40,000. Before coughing, tubercle bacilli were found in the throat secretions of 15 out of the 20 patients, and in the anterior-mouth secretions of 10 of the 20 patients.

I wish to thank Dr. A. Joe for permission to examine patients in the wards of the Edinburgh City Infectious Diseases Hospital.

REFERENCES

Appleton, J. L. T. (1944). *Bacterial Infection*, Philadelphia.
—— Klein, H., and Palmer, C. E. (1938). *Amer. J. Hyg.*, **28**, 213.
Arnold, L., Ostrom, M. L., and Singer, C. (1928). *Proc. Soc. exp. Biol.*, N.Y., **25**, 624.
Avery, O. T., *et al.* (1917). Rockefeller Inst. Med. Res., Monograph No. 7, New York.
Bézi, I. (1932). *J. Immunol.*, **23**, 1.
Bloomfield, A. L. (1919). *Amer. Rev. Tuberc.*, **3**, 553.
—— (1921). *Johns Hopk. Hosp. Bull.*, **32**, 290.
—— (1922). Ibid., **33**, 145.
—— and Felty, A. R. (1924). Ibid., **35**, 115.

Boissard, J. M., and Fry, R. M. (1941). *Publ. Hlth.*, London, **54**, 105.
—— —— (1942). *Lancet*, **1**, 610.
Bourdillon, R. B., and Lidwell, O. M. (1941). Ibid., **2**, 365.
—— —— and Lovelock, J. E. (1942). *British Medical Journal*, **1**, 42.
Brown, W. A., and Allison, V. D. (1937). *J. Hyg.*, Camb., **37**, 1.
Casassa, M. T. (1937). *Glor. Batt. Immun.*, **18**, 381.
Chapin, C. V. (1912). *The Sou ces and Modes of Infection*, New York.
Colebrook, L. (1933). *British Medical Journal*, **2**, 723.
Cornet, G. (1889). *Z. Hyg.*, **5**, 191.
Crosbie, W. E., and Wright, H. D. (1941). *Lancet*, **1**, 656.
Cruickshank, R. (1941). Ibid., **1**, 493.
De Waal, H. L. (1940). *J. Hyg.*, Camb., **40**, 172.
Dold, H., and Weigmann, F. (1935). *Z. Hyg. InfektKr.*, **116**, 158.
Duguid, J. P. (1945). *Edinb. med. J.*, **52**, 385.
—— (1946). In press.
Edward, D. G. ff. (1941). *Lancet*, **2**, 664.
—— (1944). *J. Hyg.*, Camb., **43**, 256.
Gloyne, S. R. (1922). *Tubercle*, **3**, 497.
Gordon, M. H. (1916). *British Medical Journal*, **1**, 849.
Gulbrandsen, L., and Kel'er, R. (1935). *Illinois med. J.*, **68**, 336.
Hamburger, M. (1944). *J. infect. Dis.*, **75**, 71.
—— Green, M. J., and Hamburger, V. G. (1945). Ibid., **77**, 68, 96.
—— Puck, T. T., Hamburger, V. G., and Johnson, M. A. (1944). Ibid., **75**, 79.
Hare, R. (1940). *Canad. publ. Hlth. J.*, **31**, 539.
—— (1941). *Lancet*, **1**, 85.
—— (1945). *British Medical Journal*, **1**, 383.
Heymann, B. (1901). *Z. Hyg. InfektKr.*, **38**, 21.
Jennison, M. W. (1942). In *Aerobiology*, Amer. Assoc. Adv. Sci. Pub., No. 17, p. 106, Washington, D.C.
Kanter, F., and Appleton, J. L. T. (1940). *J. dent. Res.*, **19**, 279.
Laschtschenko (1899). *Z. Hyg. InfektKr.*, **30**, 125.
Min. Hlth. Rep., 1930, Publ. Hlth. med. Sub., No. 58, London.
Min. Hlth. Rep., 1939, Publ. Hlth. med. Sub., No. 90, London.
Nassau, E. (1941). *Proc. roy. Soc. Med.*, **34**, 397.
Paine, C. G. (1935). *British Medical Journal*, **1**, 243.
Peacock, S., Bigler, J. A., and Werner, M. (1939). *Amer. J. Dis. Child.*, **57**, 759.
Reiche, F. (1915). *Z. klin. Med.*, **81**, 199.
Stillman, E. G. (1917). *J. exp. Med.*, **26**, 513.
Thomas, J. C. (1941). *Lancet*, **1**, 433.
—— and van den Ende, M. (1941). *British Medical Journal*, **1**, 953.
Van den Ende, M., Lush, D., and Edward, D. G. ff. (1940). *Lancet*, **2**, 133.
Wells, W. F. (1934). *Amer. J. Hyg.*, **20**, 611.
—— (1935). *J. industr. Hyg.*, **17**, 253.
—— and Wells, M. W. (1936). *J. Amer. med. Ass.*, **107**, 1698.
White, E. (1936). *Lancet*, **1**, 941.
Williams, R. E. O., and Harper, G. J. (1944). *Mon. Bull. Min. Hlth. and Emerg. publ. Hlth. Lab. Serv.*, **3**, 86.
Winslow, C. E. A., and Robinson, E. A. (1910). *J. infect. Dis.*, **7**, 17.
Wright, J., Cruickshank, R., and Gunn, W. (1944). *British Medical Journal*, **1**, 611.
Ziesché, H. (1907). *Z. Hyg. InfektKr.*, **57**, 50.

PLASMA VISCOSITY: A CLINICAL TEST

BY

JOHN HARKNESS, M.B., B.Sc.
The Royal Asylum, Montrose

JOHN HOUSTON, M.B., D.P.H.
The Crossley Sanatorium, Frodsham
AND
R. B. WHITTINGTON, M.Sc.
The University, Manchester

While investigating the mechanics of blood sedimentation one of us (Whittington, 1942) found that if the maximum rate of fall of the cells is plotted against the plasma viscosity a complex pattern is formed. Under strictly controlled conditions this pattern is reproducible in any laboratory. Its somewhat bizarre appearance is shown by Fig. 1, which incorporates the results of our further investigations. Fig. 1 shows, moreover, that if the controlled E.S.R. is even a roughly proportionate index of a patient's pathological condition the plasma viscosity is not. And, of course, vice versa. From 63 cases of pulmonary tuberculosis Miller (Miller and Whittington, 1942) concluded that plasma viscosity was the more significant index. The 645 experiments reported here confirm this finding.

Method

Our technique is given in detail elsewhere (Houston, Harkness, and Whittington). Lack of space prohibits its full reproduction here. It is based on the use of a viscometer* which requires only 0.7 ml. of plasma and which is capable of an accuracy of about 99.8%. A water-bath, centrifuge, and stop-watch are the only other special pieces of apparatus required.

The viscosities quoted here are all "referred to Viscometer No. V5." Individual viscometers, if correctly calibrated, will agree in their results for pure liquids; but the apparent viscosity of a given colloidal solution will differ somewhat from instrument to instrument. Thus every viscometer will give its own characteristic version of Fig. 1. This phenomenon may be made use of to standardize viscometers for plasma: the method is described elsewhere (Houston, Harkness, and Whittington).

A simpler scheme of standardization is as follows: any new viscometer, direct from the glass-blower, may be set up alongside V5 (which is still in existence) and a series of three plasmas (one normal, one medium, and one high-viscosity) run through both instruments. These three double tests provide in themselves enough data for the accurate calibration of the new instrument, which will give plasma viscosities "referred to V5" as in Fig. 1. Those investigators wishing to build up their own version of Fig. 1 for themselves will require to measure maximum sedimentation velocities in the manner described (Houston, Harkness, and Whittington).

Our results are given here for citrate plasma prepared by centrifuging a mixture of one part of 3.8% sodium citrate solution and four parts of venous blood. An empirical correction (Houston, Harkness, and Whittington) has been made for varying plasma dilution due to haematocrit variations.

Material

In all, 645 experiments were carried out; 223 were on cases of pulmonary tuberculosis at the Crossley Sanatorium, and 385 on patients with various pathological conditions encountered in Montrose Asylum (850 beds). These conditions included skin sepsis, gangrene, syphilis, malaria, paratyphoid, rheumatic fever, meningitis, pneumonia, pernicious anaemia, cerebral haemorrhage, carcinoma, and bone and pulmonary tuberculosis. In addition, 37 controls were drawn from radiologically and clinically normal members of the sanatorium staff and from psychotic patients who were physically normal.

Results

Space will not permit the reproduction of our results in detail. It is hoped that the four diagrams will summarize them effectively.

Fig. 1 was prepared by plotting simultaneous measurements of plasma viscosity and maximum sedimentation velocity (under strictly standardized conditions of cell volume, etc.). For convenience in considering the clinical aspect of our results the viscosity range (from roughly 1.4 to 2.1) has been arbitrarily divided into numbered zones by perpendiculars drawn from the "wave-peaks" as shown in Fig. 1. The 37 normal controls had a mean viscosity of 1.546. Of these, 30 (81%) fell in zones 1 to 3, the remainder falling in zone 4, with the highest at 1.626. There is, of course, no clearly defined boundary of normality, and zone 4 may be regarded as a threshold or transition range.

Fig. 2 shows the average viscosities corresponding to normal and Ministry of Health groups "minus," "plus 1," "plus 2," and "plus 3" in pulmonary tuberculosis. These cases were classified at the Crossley Sanatorium.

At Montrose, 177 tests in all were done on 79 patients giving viscosities in zone 6 or higher. These patients were suffering from various diseases. Using the maximum viscosity recorded for each patient, the accompanying Table gives the incidence of deaths among these high-viscosity cases.

Table showing Death Rate in Viscosity Zones

Viscosity Zone (V5)	Number of Cases	Deaths	
		No.	%
6	25	5	20
7	19	7	37
8	9	4	44
9	17	11	65
10	5	3	60
11	4	4	100
Totals ...	79	34	43

Discussion

(a) General

The conclusion to be drawn from Fig. 2 seems inescapable. At least in a chronic disease such as pulmonary tuberculosis, there is an increase of viscosity corresponding on the whole to an increase in the extent and severity of the disease process.

* Supplied (to the design of R. B. W.) by the Scientific Glass-Blowing Company, 12-14, Wright Street, Manchester, 15.

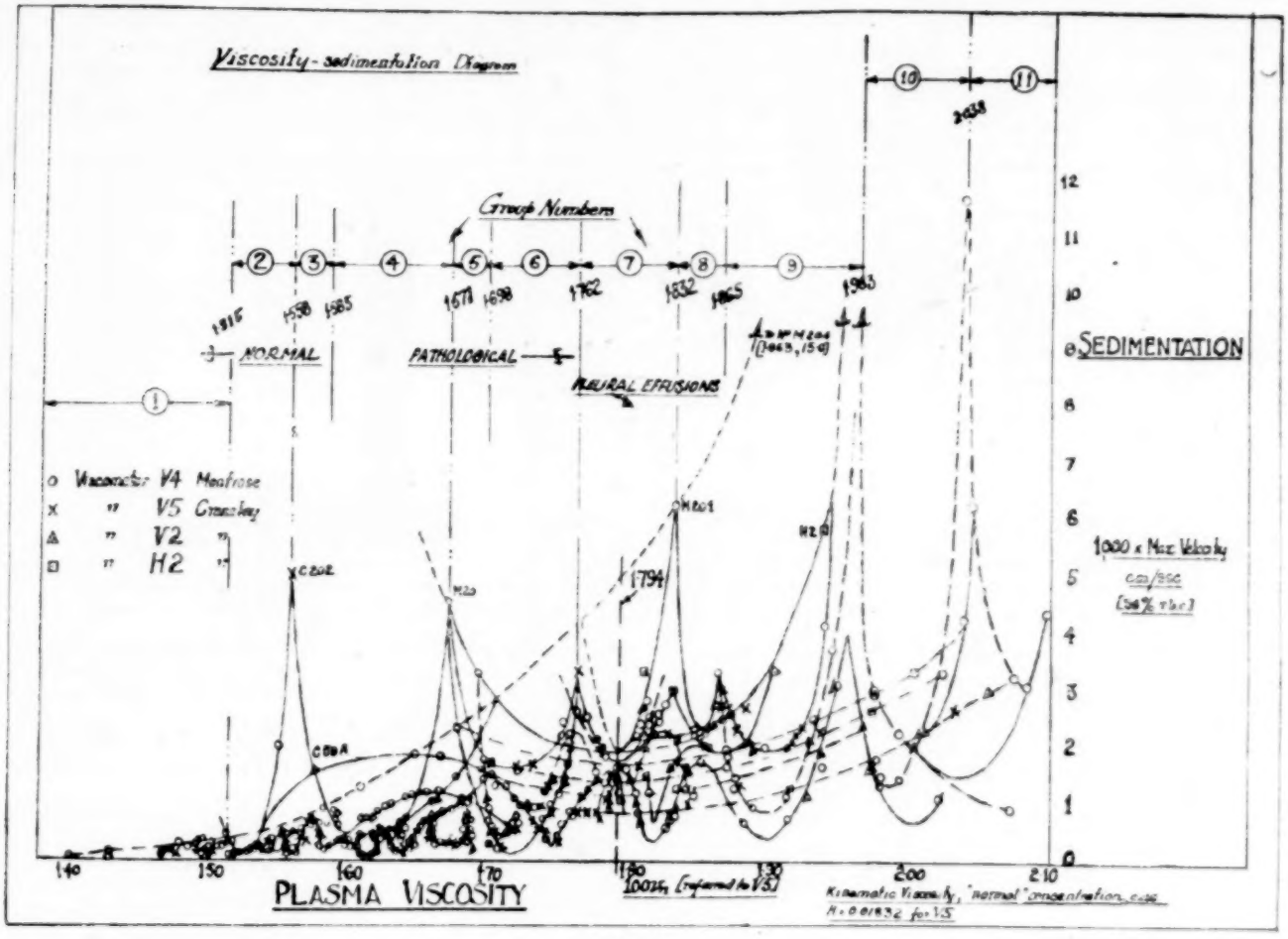


FIG. 1

(Of course, Fig. 2 shows only average results. It would be absurd to claim, for example, that every tuberculous patient with a viscosity of 1.77 must necessarily fall into the Ministry of Health group plus 2: the diagram merely implies that if a large number of patients in group plus 2 be examined the average of their plasma viscosities will be about 1.77—referred to V5.)

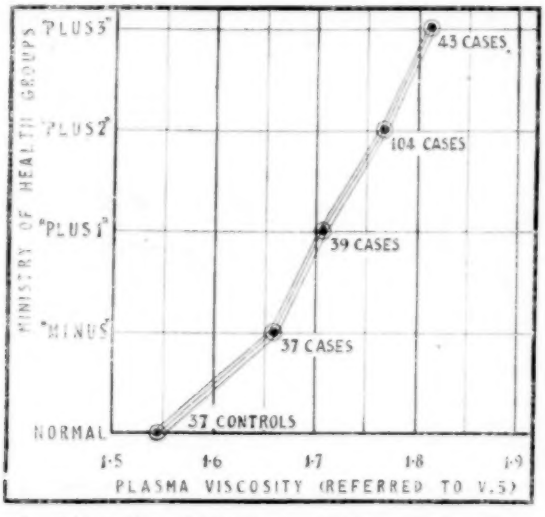


FIG. 2.—Distribution of Ministry of Health groups in pulmonary tuberculosis (223 cases + 37 controls).

But Fig. 2 refers only to pulmonary tuberculosis: from our experience in following the progress of both acute and chronic cases we are of the opinion that in general the viscosity increases (i.e., there is a shift to the right in Fig. 1) as the physical condition worsens; and that with recovery the viscosity decreases again (corresponding to a shift to the left). Intervening complications or intercurrent infections may temporarily reverse the latter movement.

The grave prognosis in general to be associated with very high viscosities is, we feel, an inevitable conclusion to be drawn from the Table. That this, however, *is* only a generalization is shown by the fact that two patients with viscosities in zone 10 did eventually recover. (They were cases of paratyphoid and of rheumatic fever.)

We have mentioned that there is no clearly marked boundary between the normal and the pathological, but that zone 4 may be regarded as a threshold range. Here fall the early and the late results of pathological processes, together with some normals. The finding of a result in zone 4 appears to call for further investigation. This conclusion was brought home to us at Montrose, where two mental patients who were normal to physical examination and picked to act as normal controls gave results high in zone 4. Within six months they both developed definite signs of pulmonary tuberculosis. Further, a member of the staff who gave a high zone 4 viscosity reading, and who was at the same time clinically, radiologically, and bacteriologically negative, developed active pulmonary tuberculosis within three months.

A zone 4 viscosity, then, may be held to call for further investigation; but it need not occasion alarm. Seven of the Crossley staff controls were (low) in zone 4, and have as yet shown no signs of pathological disturbance. We have evidence that the use of the sulphonamide drugs can produce an increase in the plasma viscosity sufficient to shift a physically normal zone 2/3 individual into zone 4: other drugs may have a similar action. Moreover, we have as yet totally insufficient data as to physiological changes—e.g., menstruation; nor do we know

to what extent a trifling infection (such as a common cold) may affect the viscosity.

A glance at Fig. 1 will confirm what we have said already—that viscosity and corrected sedimentation velocities cannot both be accurate indices: in our experience reliability is to be placed on the viscosity test, whatever the sedimentation result may be. Cases will be seen in Fig. 1 with extremely high viscosities but with sedimentation velocities falling within the range of normality. Case C202 is an interesting (though rare) example of the converse phenomenon, occurring in a clinically and radiologically normal female member of the sanatorium staff. Only five higher sedimentation velocities were ever recorded in our whole series. Viscosity was normal (zone 2/3). Repeated after 14 days, both velocity and viscosity results were practically identical. Observation of the sedimentation rate alone would have occasioned great alarm. Seven months after test C202, she is still perfectly healthy.

(b) Terminal Decay

Here we must describe an exception to the foregoing generalizations—a process which by its very exception may be of great importance to prognosis. So far we have in effect described a cycle of viscosity (normal—maximum—normal), a cycle which coincides with the clinical cycle (health—disease—recovery). But in many cases in which the disease process continues without respite to a fatal end the viscosity rises to a maximum value and then gradually falls towards the normal. In this way a value in the range of the normal may be reached in the moribund. We have called this phenomenon "terminal decay." In chronic conditions it may appear months before death, while in acute conditions it may precede death only by a few days or even a few hours. Some examples of this terminal phenomenon are shown in Fig. 3. We cannot state positively that this viscosity cycle (normal—maximum—normal) is invariably followed. It will be appreciated that the necessary evidence is not easily obtained from human subjects; but the general case is illustrated by the curves of Fig. 3.

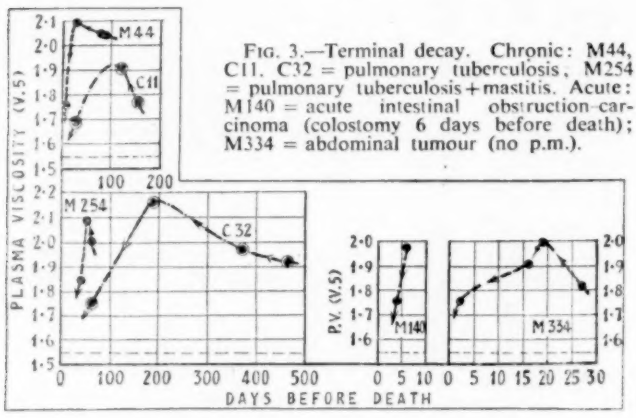


FIG. 3.—Terminal decay. Chronic: M44, C11, C32 = pulmonary tuberculosis, M254 = pulmonary tuberculosis + mastitis. Acute: M140 = acute intestinal obstruction-carcinoma (colostomy 6 days before death); M334 = abdominal tumour (no p.m.).

Thus, before finally accepting any plasma-viscosity measurement as an indication of clinical condition, the possibility of decay must be considered. If this possibility is not out of the question the test should be repeated after a suitable interval. If the viscosity is increasing, decay is not present provided there is no intercurrent disturbance. If the viscosity is falling the plasma is either on the terminal path or is showing recovery. We feel that the clinician will easily decide this point. Sometimes, however, it is clear from a single viscosity reading that a patient is on the terminal path—for example, Case C50A, viscosity 1.576 (zone 3), 21 days before death from pulmonary tuberculosis. Here the viscosity result merely emphasized what was clinically all too obvious.

Fractionation of the plasma proteins is of distinct value in the recognition of terminal decay; but unfortunately any discussion of the serum and plasma proteins is beyond the scope of the present brief report.

(c) Plasma Viscosity and Management of Pleural Effusions

Fig. 4 shows the incidence of pleural effusions in 23 cases. There was definite clinical and radiological evidence pointing to the actual formation of fluid at the time of test in each case. Fifteen (65%) were found to be in viscometric zone 7.

We consider Fig. 4 highly suggestive. It appears to indicate that zone 7 forms a critical region in which the exudation of fluid is highly probable. Of course our present small number of cases does not allow us to lay down definite limits beyond

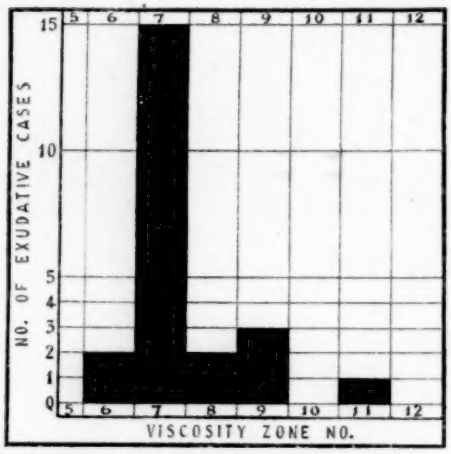


FIG. 4.—Distribution of pleural effusions (23 cases).

which fluid *cannot* be exuded. But our experience indicates that if an effusion be aspirated while the viscosity is in zone 7 the fluid will re-form; recurrence is unusual when aspiration is delayed until the plasma viscosity has shifted either to the right or to the left. We have found, moreover, that a recovering patient sometimes has an effusion as his viscosity passes through zone 7 from right to left.

Viscosity measurements may thus prove of importance in the management of pleural effusions. (We hope to investigate this possibility further.)

Conclusions

Plasma viscosity can be of diagnostic value in revealing otherwise hidden pathological changes, as is emphasized in the Discussion (*a*). As a diagnostic test, however, it seems to be completely non-specific.

The prognostic value of the viscosity test appears to be high.

The viscosity test should be found valuable in the treatment of chronic disease, inasmuch as it provides a good index of deterioration or recovery.

Viscosity estimations may have special value in the management of pleural effusions.

A comparison of the sedimentation velocities in Fig. 1 with our findings for viscosity should show the impossibility of correlating sedimentation rates (even under controlled conditions) with the clinical picture.

These conclusions are drawn from 645 experiments on the plasma viscosity in a wide variety of pathological conditions.

We wish to thank our committees of the Royal Asylum, Montrose, and of the Crossley Sanatorium, Frodsham, for the facilities kindly afforded. Invaluable technical work was done by Miss Norah Brown and Mr. Archibald C. Harris.

REFERENCES

Houston, J., Harkness, J., and Whittington, R. B. *Acta tuberc. scand.* (in press).
Miller, A. K., and Whittington, R. B. (1942). *Lancet*, **2**, 510.
Whittington, R. B. (1942). *Proc. roy. Soc.*, B, **131**, 183.

At the annual meeting of the Governors of the Dental Hospital of Manchester it was announced that a department of preventive dentistry and research is to be created. Its work is to be linked with the school health services and maternity welfare centres, and with the new department of child health. Funds for the research to be undertaken have been provided by the Nuffield Trustees, who have made a grant of £30,000 spread over ten years. The University is also expected to provide financial assistance. The team of specialists will include an experimental physiologist, a bacteriologist, and two research fellows, together with the necessary laboratory and technical assistance and clerical staff." The intention is to launch a large-scale clinical study of the causation of dental disease.

NON-ABSORPTION OF MEPACRINE: DESCRIPTION OF A CASE

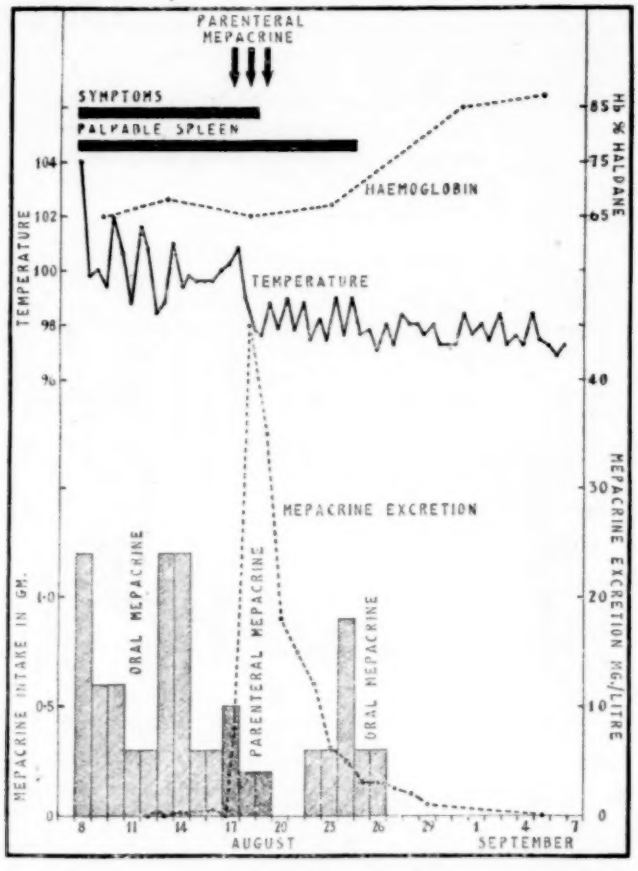
BY

JOHN YUDKIN, M.D., Ph.D., F.R.I.C.

In a paper published last year (Yudkin, 1945) I suggested that patients with malaria who do not respond well to oral mepacrine therapy might show a low urinary excretion of the drug. In such cases parenteral administration might be of value. Since then I have examined specimens of urine from hundreds of individuals on suppressive or therapeutic mepacrine and had not found one in whom there was a failure of absorption, nor has it been reported by other workers. In August, 1945, however, such a case was seen in a West African military hospital. The patient was a young European naval rating with malaria who did not respond to large doses of mepacrine orally; he excreted only extremely small quantities of the drug in the urine and responded rapidly to a few small doses intramuscularly.

Case History

A stoker aged 20 was admitted to a naval sick bay on July 18, 1945, with "fever." Parasites of M.T. malaria were found in the blood and he was treated with quinine 10 gr. (0.65 g.) t.d.s. for 5 days. He did not improve, and was transferred to the military hospital on July 23. Examination of the blood revealed no malaria parasites, but he was still pyrexial, had rigors, was vomiting, and complained of abdominal pain and headache. He was given a course of mepacrine as follows: 0.2 g. four-hourly for 24 hours, 0.1 g. four-hourly for 48 hours, and 0.1 g. t.d.s. for 48 hours—that is, a total of 3 g. in five days, in daily amounts of 1.2, 0.6, 0.6, 0.3, and 0.3 g. The patient was symptomless in four days, no parasites were present in the blood, and he was discharged fit on Aug. 1.



On Aug. 4 he reported again to the sick bay with pain and tenderness in his left foot. His temperature was 100°, and examination of the blood showed the presence of parasites of M.T. malaria. His foot was treated with local heat, and the condition subsided in three days. His malaria was treated with quinine 10 gr. t.d.s. for four days but again did not respond, and he was admitted to the military hospital on Aug. 8. On admission he complained only of fever and malaise; his temperature was 104° and his pulse 112; his spleen was palpable, and malaria parasites (*P. falciparum*) were again seen in the blood films. The same course of mepacrine was started at once. At the end of the fifth day, after 3 g. of the drug, he was still pyrexial and his symptoms and general condition somewhat worse. He was given further large doses of oral mepacrine for four more days—1.2, 1.2, 0.3, and 0.3 g.—this time under the direct supervision of the sister. In spite of the total of 6 g. in nine days his condition showed no signs of improving, and malaria parasites were still found on Aug. 17. Examination of the blood on the day after admission showed a haemoglobin of 65% (Haldane) and a white cell count of 8,400. An attempt to improve the haemoglobin level was made by the administration of pil. ferri sulph. 2 t.d.s., but the haemoglobin was still 65% on Aug. 18.

Urinary analysis between Aug. 12 and 17 had demonstrated little or no mepacrine—never more than 0.5 mg./litre—whereas all other patients examined showed a concentration of 40–80 mg./litre after the first gramme of the drug.

On Aug. 17, the tenth day in hospital, it was decided to use intramuscular mepacrine. A total of 0.9 g. was given in divided doses—0.3 g. at 2 p.m. and 0.2 g. at 6 p.m. on Aug. 17, 0.2 g. at 6 a.m. on Aug. 18, and 0.2 g. at 10 a.m. on Aug. 19. Within 36 hours of the first injection the patient was free from all symptoms and his temperature had fallen to 98°. Malaria parasites were consistently absent from the blood from Aug. 18 onwards. During the remainder of his stay in hospital his temperature never exceeded 99°. The spleen ceased to be palpable one week after the first injection. The haemoglobin responded now to the continued administration of iron in the same doses, and a level of 85% was reached by Aug. 31.

An index of the levels of mepacrine in the blood is given by the results of urinary analysis. One hour after the first injection the concentration rose to 8 mg./litre; one hour after the third injection it was 45 mg./litre, and thereafter it began to fall. On Aug. 22, when the concentration had fallen to 12 mg./litre, further oral mepacrine was begun, and a total of 2.1 g. was given over 5 days—0.3, 0.3, 0.9, 0.3, and 0.3 g. In spite of this the concentration of urinary mepacrine continued to fall steadily, and reached zero on Sept. 5. Before discharge it was decided to see whether the patient was able to absorb quinine. From Aug. 28 he was given 5 gr. (0.32 g.) daily; all specimens of urine examined subsequently showed the presence of quinine by giving a positive Tanret reaction. He was discharged from the hospital on Sept. 6 and instructed to continue prophylactic quinine pending his return to the United Kingdom.

Discussion

Urinary specimens from very large numbers of individuals taking mepacrine by mouth have been examined by the numerous workers in this field. No case has previously been described in which there was an almost complete failure to absorb the drug. The interesting features of the present case are the attack of malaria within two weeks of a previous attack, the lack of response to large doses of oral mepacrine, and the rapid response to relatively small doses of parenteral mepacrine. The absence of all but traces of urinary mepacrine during oral administration and the high concentration after parenteral administration, followed by the rapid clinical improvement, show that the absence of response to oral mepacrine was due to a failure of absorption from the alimentary canal. Another interesting feature was the failure to improve the haemoglobin level with iron until the malarial infection had been removed.

It is not clear why both attacks of malaria did not respond to oral quinine. It is possible that the patient did not absorb quinine during the malarial process, although he was able to do so after he had been cured. The inability to absorb oral mepacrine, however, persisted after his cure. The fact that the second attack of malaria occurred within three days after being discharged from hospital following his first attack shows that this attack, too, had not been cured by oral mepacrine.

Summary

A case of M.T. malaria in a European in West Africa which failed to respond to intensive therapy with oral mepacrine is described. Urinary analysis showed that the patient was not absorbing the drug. Subsequent administration of mepacrine intramuscularly resulted in a rapid recovery.

I have to thank Col. A. J. Leslie-Spinks, commanding officer, and Lieut.-Col. A. S. Hollins, officer in charge of a Medical Division, for permission to publish this case. I am especially grateful to Capt. P. U. Colyer, medical specialist, for his keen co-operation and his generous clinical advice.

REFERENCE

Yudkin, J. (1945). *J. trop. Med. Hyg.*, **48**, 1.

THE CEPHALIN FLOCCULATION TEST IN MALARIA

BY

JACK G. MAKARI, B.A., M.D.

(From the Department of Bacteriology, American University of Beirut)

Since the cephalin-cholesterol flocculation test was first described by Hanger in 1938 it has been applied almost entirely to the study of diseases of the liver parenchyma, especially to jaundice and cirrhosis. Hanger (1939) used the test in the differentiation of obstructive from hepatogenous jaundice. These findings were confirmed by Nadler and Butler in 1942. Hanger and Patek in 1941 correlated the results of the test and the clinical course of 40 patients with liver cirrhosis. In 1942 Mateer and his co-workers made a very thorough comparative study of the newer liver function tests and came to the conclusion that the cephalin flocculation test is one of the three best hepatic function tests recommended for routine use.

The clinical investigators who have made extensive use of the cephalin-cholesterol flocculation test seem to agree that: (1) the test is negative in normal individuals; (2) it is a more sensitive indicator of active disturbance of the liver parenchyma than any of the so-called liver function tests; (3) it provides the best available indicator as to prognosis in hepatic disease. I have been unable to find in the literature any mention of the use of this test as an index of "insult" done to the liver by infectious processes.*

The purpose of this paper is to report my findings on the behaviour of the cephalin flocculation test in malaria, with consideration of the possible use of the test as an index of the activity of malaria parasites in the tissues of the host.

The cephalin† used was prepared according to the method described by Hanger (1938). The preparation of the testing emulsion and the method of reading and recording the results of the tests conformed with Hanger's original procedure. The cases studied consist of three groups: (1) cases of malaria collected from Anjar‡; (2) cases of malaria observed in the wards of the American University Hospitals; and (3) cases in which malaria and liver disease were ruled out.

Group 1: Cases of Malaria Collected from Anjar

The sera of 92 cases were studied in individuals varying from 4 to 80 years of age. The duration of symptoms varied from 2 weeks to 3 years. In each case we obtained: (1) a short clinical history; (2) the size of the liver and the splenic index in centimetres; (3) blood smears for malaria; (4) blood for the cephalin flocculation test. Only two cases which had no history of chills, fever, splenic enlargement, or other signs of malaria could be included as controls. In both, smears for malaria and cephalin flocculation tests were negative.

Results.—Of the 92 persons with a positive history 83 had a positive cephalin flocculation reaction—80 of these being + + and above—and 65 had positive smears. Of the 9 cases with a negative cephalin flocculation reaction 4 had negative smears, 4 had *Plasmodium falciparum* infection, and only one had *Plasmodium vivax* parasites in the blood smear. There seems to be no definite correlation between sex, age, duration, last attack in days, splenic enlargement, and the cephalin flocculation test. The correlation between the clinical diagnosis, the cephalin flocculation test, and positive blood films is shown in Fig. 1.

Table showing Distribution of Cephalin Flocculation Reactions in 92 Cases of Malaria from Anjar. (Group 1.)

Cephalin Flocculation Test:	0	±	+	++	+++	++++	Total
P. vivax	1	—	—	1	4	8	14
P. falciparum	4	1.	—	—	3	15	23
P. vivax and P. falciparum	—	—	—	—	1	2	3
Qu stionable rings	—	—	—	2	2	19	23
Neg. smear but positive history	4	1	1	5	3	15	29
Total	9	2	1	8	13	59	92

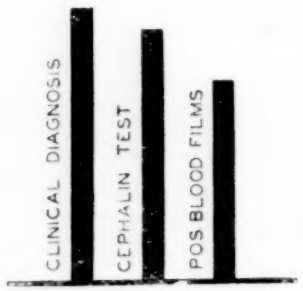


FIG. 1.—Correlation between clinical diagnosis, the cephalin flocculation test, and positive blood films in 105 cases of malaria.

On the basis of the above data we conclude that in malaria the cephalin flocculation reaction is predominantly positive, and may be strongly so.

Group 2: Cases of Malaria Observed in the A.U.B. Hospital

This group consists of 13 subjects varying from 14 to 67 years of age. In addition to the procedures followed in Group 1, these cases had their cephalin flocculation tests repeated with a view to finding the response of the test to antimalarial treatment.

Results.—In all of these cases except one the cephalin flocculation reaction was strongly positive on admission (+ + and above), and came down to + or negative after antimalarial treatment was administered (Fig. 2). In the one exception which showed a tendency to relapse despite intensive antimalarial treatment given thrice in the hospital, the cephalin reaction remained consistently + + + even when the patient no longer had symptoms of malaria and was readmitted to the E.E.N.T. Service for ulcerative keratitis. I have used the test on cerebrospinal fluid in two cases with cerebral malaria and coma and found it

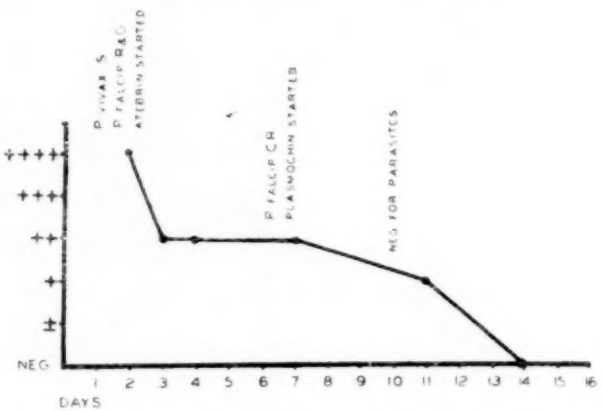


FIG. 2.—Behaviour of the cephalin flocculation test in a case showing satisfactory response to therapy.

* After this paper was written Mirskey and co-workers reported on the test being positive in ten cases of malaria. This preliminary report, entitled "Hepatic Dysfunction in Malaria," was published in *Science*, 1944, **99**, 20. They noted that patients treated with a high-carbohydrate high-protein high-vitamin diet showed a rapid disappearance of the positive cephalin reactions, while patients not treated in this manner showed a positive reaction for as long as one year after the last attack. Group 2 in my series were not treated in the manner those authors describe; in fact, these patients received ordinary ward diets, and yet their reactions became negative within a period of about two weeks from the start of antimalarial treatment.

† The cephalin used was prepared in the Department of Biochemistry of the American University of Beirut.

‡ Anjar is an Armenian refugee village situated in the Beka'a Valley, on the outskirts of the Anti-Lebanon Mountains, on the Damascus road 15 km. from Chtaura. It is one of the worst-infested malarious districts in Syria and the Lebanon.

to be + +. The cephalin flocculation test done on the blood of these two cases was + + in one case and + + + in the other. Blood smears showed the presence of *P. falciparum* in both cases. In a case of chronic malaria with splenomegaly the cephalin flocculation test on the splenic blood was + + +, while on the peripheral blood it was + + + +, despite the fact that no malaria parasites could be demonstrated from either the splenic puncture material or the peripheral blood.

On the basis of the above data it seems reasonable to conclude that the cephalin flocculation test is an index of malarial activity in the tissues of the host.

Group 3: Cases in which Malaria and Liver Disease were Ruled Out (Controls)

This group of 90 cases consisted of subjects observed in the A.U.B. Hospital wards, and may be considered as a group of controls.

Results.—In all cases the cephalin flocculation test was negative.

Discussion

In this paper I have presented evidence that in the great majority of malaria cases the cephalin flocculation test is positive to a significant degree. The percentage of positive tests was greater than the percentage of positive smears in our series. The fact that the test became positive near the onset of clinically recognizable symptoms should facilitate an early diagnosis of malaria where infectious hepatitis is ruled out, even though splenic enlargement may not be noted and blood films may still be negative for plasmodia.

I suggest that the cephalin-cholesterol flocculation test be carried out as a routine on all prospective blood-bank donors, and that all positive reactors be excluded as possible carriers of malaria or infectious hepatitis. The need for the application of such a procedure to persons who have been in highly malarious areas, particularly returning personnel of the armed Services, is obvious. The simplicity, reliability, and established significance of this test in infectious hepatitis and chronic malaria make it the obvious method of choice for routine use.

Summary

The cephalin flocculation test was done on sera obtained from 105 malaria cases. A positive flocculation reaction was obtained in 96 cases (91.4%), it being + + and above in 94 cases (89.5%). The proportion of positive smears was 73.7% (77 cases).

The cephalin flocculation test tended to become negative with antimalarial treatment. It thus may be used safely as an index of the activity of malaria parasites in the host.

Use of the test on cerebrospinal fluid is suggested in cerebral malaria to determine the degree of activity of the infection.

Routine use of the cephalin test on all prospective blood-bank donors is also suggested.

I am indebted to Dean G. H. Miller, Professor of Internal Medicine, Drs. E. W. Dennis, Professor of Bacteriology, and S. E. Kerr, Professor of Biochemistry, of the School of Medicine of the American University of Beirut, for their encouragement and valuable suggestions, and to Miss A. Der Boghossian and Mr. K. Seradairian for their technical assistance. I also wish to thank Professors H. Yeni-Komshian, G. Khayat, and C. Baylor, of the Department of Internal Medicine, A.U.B. Hospital, for permission to include their cases in this paper.

REFERENCES

Hanger, F. M. (1938). *Trans. Ass. Amer. Phys.*, **53**, 148.
—— (1939). *J. clin. Invest.*, **18**, 261.
—— and Patek, A. J. (1941). *Amer. J. med. Sci.*, **202**, 48.
Mateer, J. G., Baltz, J. L., Marion, D. F., and Hollands, R. A. (1942). *Amer. J. digest. Dis.*, **9**, 13.
Nadler, S. B., and Butler, M. F. (1942). *Surgery*, **11**, 732.

The Minister of Health has made an Order under Section 2 of the Water Act, 1945, dealing with the constitution of the new statutory Central Advisory Water Committee, which will be set up in due course. The Order follows the lines of that for the Central Housing Advisory Committee, by providing that the Minister himself shall be in the chair and the Parliamentary Secretary will be the vice-chairman. The committee will have twenty other members, and, like the previous non-statutory committee under the chairmanship of Lord Milne, will represent all the interests concerned with water-supply matters. Members will be appointed for four years with 50% retirement every two years.

SOME PAEDIATRIC PROBLEMS PRESENTED AT BELSEN CAMP

BY

W. R. F. COLLIS, M.D., F.R.C.P., D.P.H.
Senior Medical Officer, British Red Cross Commission for Civilian Relief, Belsen Camp

AND

P. C. MacCLANCY, L.R.C.P.&S.I.
Medical Officer, British Red Cross Society, Belsen Camp

Looking through the case records from the paediatric department in the Belsen Hospital three cases seem worthy of permanent record.

Case I

A Czech girl aged 14 was found somewhere in the hospital area in a very bad condition with the diagnosis of "heart disease." She was removed to the children's hospital and her case was worked up as fully as possible. She had a past history of typhus in the horror camp. Before admission to the children's hospital the notes on her case stated that she had been suffering from diarrhoea and had shown some oedema. For the latter she had received injections of nicotinic acid and salyrgan, and sulphathiazole by mouth. She was rather big for her given age (probably more than 14 years), was much emaciated, and appeared conscious of her surroundings but unusually apathetic. Temperature 99–102° F.; pulse 120.

On examination cardiac dullness was found to extend some 2½ in. (6.3 cm.) outside the left nipple line and 1½ in. (3.8 cm.) to the right of the sternum and above the third rib. There was no visible pulsation. The heart sounds were normal; no murmurs. There was a cough with a little sputum. Moist sounds were heard all over the chest, most pronounced on the left side. C.N.S.: Reflexes were decreased or absent. The abdomen was thin but not tender; there was intermittent diarrhoea. No oedema was present. The urine was normal. Radiographs revealed considerable enlargement of the heart towards both sides and soft generalized shadows in both lungs. "The appearance suggests dilatation seen in initial stages of mitral disease, and the lung condition is compatible with pulmonary passive congestion" (see Fig. 1). The blood sedimentation rate for the

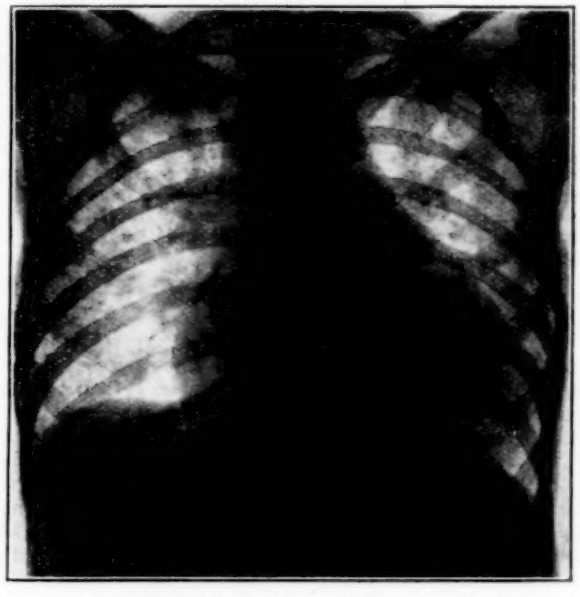


FIG. 1.—Skiagram of Case I, June 1, 1945.

first hour was 144 mm. (Westergren); blood urea, 12 mg./100 c.cm.; plasma protein, 6.5 mg./100 c.cm.; haematocrit, 26; colour index, 0.9; haemoglobin, 55%; red blood cells, 2,960,000; white blood cells, 5,800 (polymorphs 62%, lymphocytes 30%)*: *normocytic normochromic anaemia; no iron deficiency.*

After discussion pericarditis was considered to be the most probable diagnosis, taking into account the temperature, the size of the heart, and the lack of murmurs. Aspiration of the pericardium was attempted, the posterior route being chosen. The needle was

* Blood examinations carried out by Capt. P. L. Mollison.

pushed slowly as far as the heart muscle and slowly withdrawn, but only a few drops of blood entered the syringe.

We considered the matter again in the light of this finding, and felt that the most likely diagnosis was still pericarditis, probably tuberculous, with pus too thick to pass through the needle. The possibility of a pure dilatation due to vitamin B deficiency was also considered, and the child was given a diet rich in vitamin B_1 and later injections of thiamine hydrochloride. The nicotinic acid injections were also continued. Within a week the child's appearance had quite altered. Her temperature fell to normal; she ceased to be apathetic, but remained unresponsive and somewhat hostile, though by this time all the other children in the beds around her had lost their terror symptoms. Later the temperature rose again, though not to the same height as before, but her clinical improvement was continuous. We now decided to include her among the cases for evacuation to Sweden. (Previously her condition had seemed too bad to warrant this.) She stood the journey well and was admitted to the Lung Clinic in Malmö. Here she was *x*-rayed again exactly one month after the previous film. The heart (Fig. 2)

FIG. 2.—Skiagram of Case I, July 23, 1945.

had now come in completely; the skiagram shows, however, a considerable degree of pulmonary tuberculosis, accounting for the temperature.

One of us (W. R. F. C.) took the skiagrams to Stockholm, where he discussed the case with Prof. A. Wallgren and others. Prof. Wallgren felt that the diagnosis rested between a pure dilatation of the heart—probably of the B_1-deficiency type—or a serous effusion which had cleared up. He showed a case of the latter from his records. The general opinion leaned towards the diagnosis of a beriberi heart.

Comment on Case I

Other observers (Collis, 1945; Lipscomb, 1945; Vaughan *et al.*, 1945; Mollison, 1946) at Belsen have said that frank vitamin deficiency syndromes were rare among the adult population. Among the children we saw no case of vitamin A deficiency or scurvy, nor did we observe any case of active radiological rickets. Tetany was not uncommon, however, and many cases were undoubtedly suffering from a derangement of the calcium–phosphorus balance. Lack of facilities made it impossible for us to investigate the blood calcium, phosphorus, and phosphatase. Vitamin B deficiency (both B_1 and B_2) was, however, not uncommon. Although we did not see textbook cases of beriberi or pellagra, many of the children had lost their reflexes and had defective balance; others showed a non-infective type of diarrhoea which improved with nicotinic acid. They also showed stomatitis, glossitis, and marked pigmentation of exposed parts of the skin. Hence it is not improbable that the above case is a true beriberi heart.

Case II

This case will be of interest because of its association with tuberculous allergy and the aetiology of erythema nodosum. L. G., a boy aged 9, while in hospital suffering from a slight cold was tuberculin-tested as a routine, with a negative result. Six days later the temperature rose sharply and continued to climb, reaching 103° F. in five days. On the second day of the fever the typical red raised eruptions of erythema nodosum appeared on the extensor surfaces of the legs. The following day he was again tuberculin-tested, and the reaction had now become positive. His skiagram showed a typical early primary lesion around the hilus of each lung, spreading out into the parenchyma, particularly on the right side. The sedimentation rate was 120 mm. (first hour Westergren).

This case shows the classical picture of the primary tuberculous state in a heavily infected child with a rapidly developing high allergy and erythema nodosum.

Comment on Case II

After the typhus, starvation, and fear syndromes had been overcome the final clinical problem among the children was tuberculosis. We calculated that typhus combined with starvation had reactivated over 1,000 cases of pulmonary tuberculosis in the camp. Hence it was not surprising that a very high percentage of the children were infected. In a survey carried out by one of us (P. C. M., assisted by M. John Moerman, Ghent Medical School) 80% of the children were found to be Pirquet-positive (average age in group, 7.1 years).

Every phase of the disease was observed. We saw children, as above, at the beginning of their allergic response, in the primary complex, others healing, and others healed. There was a group of about ten showing secondary generalized spread (miliary tuberculosis, caseous bronchopneumonia, and tuberculous meningitis), and seven cases of the adult type of phthisis in children aged from 9 to 15.

It will be of interest to many to hear that the Swedish Red Cross took all but the dying patients to Sweden, where already *all* the primary cases are well on their way to recovery and most of the tertiary (adult type) are greatly improved.

Sedimentation Rate.—Mollison (1946) observed that the sedimentation rate was greatly increased in starvation states at Belsen, and that its return to normal took usually some two months. We carried out the sedimentation test in over 100 children, and repeated it on several subsequent occasions in many. Starvation alone seldom produced a sedimentation rate of over 50 mm. for the first hour. But when combined with the post-typhus state and tuberculosis the most surprising results were recorded, as in the cases above. The record was 147 mm. in the first hour (Westergren). In spite of this, however, we found the test of very great value in assessing the degree of activity to tuberculosis and the progress of our cases generally when repeated at regular intervals.

Case III

A boy, Z. Z., aged 5, was admitted to the children's hospital, Belsen, from the general hospital on the death of his mother. His mother, an Austrian Catholic, died at Belsen of typhus. The father, a Slovak Jew, last heard of in Sachsenhausen, was probably dead. A sister, aged 6, was alive and well in camp. Two other children died in Ravensbrück lager. Nothing was known of the patient's past history.

On admission he was very emaciated. He lay rolled up in a ball under the bedclothes, moaning, and wouldn't eat or speak. Examination revealed pleurisy with an effusion on the right side, and some infiltration in the right and the upper zone of the left lung. The temperature was irregular, rising to 101°. Sedimentation rate 101 mm. first hour (Westergren). Pirquet plus. 10 c.cm. of serous fluid was aspirated to exclude empyema.

The child was hand-fed with specially appetizing meals while being talked to in his own language. He was given a high-protein diet with an addition of vitamins and calcium, and at first was kept in a warm room; later he was placed in the open air. After one week he began to talk; after two weeks his appetite returned; and after eight weeks the sedimentation rate was 50 mm. He was then evacuated to Sweden. The latest report states that he has put on 7 lb. (3.2 kg.) and is now almost well.

Comment on Case III

The above case illustrates the final problem of the Belsen children. It is a social one of the most profound complexity. Here we have a little boy of 5, together with his sister of 6, whose parents have been cruelly murdered and whose family and home have been destroyed. What is to become of him? Is he to be brought up Jew or Catholic? Is he to be left in an orphanage? He has found a temporary refuge in Sweden, but what of the future?

The work reported above was greatly assisted by M. John Moerman and other members of the Shaef Medical (Belgian) Mission. Our thanks are due to the senior medical officers and offic

commanding the 9th, 29th, and 81st British General Hospitals, and to Dr. Jacobson, Swedish Red Cross, Malmö, who supplied us with the radiograph reproduced in Fig. 2. We would also like to pay a tribute to the work done by the sisters (both Q.A.I.M.N.S. and B.R.C.S.) and all others who assisted in the creation of the children's hospital at Belsen.

Many of the special supplies were sent out by the British Red Cross Commission for Civilian Relief from London.

REFERENCES

Collis, W. R. F. (1945). *British Medical Journal*, **1**, 814.
Lipscomb, F. M. (1945). *Lancet*, **2**, 313.
Mollison, P. L. (1946). *British Medical Journal*, **1**, 4.
Vaughan, J., Dent, C., and Pitt-Rivers, R. (1945). *Proc. roy. Soc. Med.*, **38**, 395.

SPONTANEOUS RUPTURE OF THE LIVER COMPLICATING PREGNANCY

BY

HAROLD LINKS, M.B., B.Ch., B.A.O.

R.S.O., King Edward VII Hospital, Windsor

If the rarity of a condition justifies its publication then the recording of this case is justified. Only one case of spontaneous rupture of the liver complicating pregnancy can be found in the literature, but there are some 28 cases of spontaneous rupture from other causes.

As early as 1844 Abercrombie reported a case of rupture of the liver complicating pregnancy. The patient, a woman have been trauma. The patient, a woman aged 35, was accustomed to obtaining relief from gastrodynia by tying a silk handkerchief round her waist. Unhappily, however (on the occasion recorded), her servant pulled so tightly that Abercrombie in his description states that "it made me fear some injury." Labour began and delivery quickly followed, and within 50 minutes the patient collapsed. At necropsy two lacerations about 1 in. (2.5 cm.) apart were found in the liver. In the case reported below there is no history of trauma.

In 1943 Rademaker reported a case of spontaneous rupture of the liver complicating pregnancy. The patient, a woman aged 32, was eight months pregnant when she suddenly developed signs of toxaemia with albuminuria and a blood pressure of 240/160. After a bout of vomiting she showed signs of intraperitoneal haemorrhage, and an operation was performed, during which lacerations in the liver were found and packed. Hysterectomy and bilateral salpingo-oophorectomy were also carried out, because "there seemed to be an opening in the uterus," and "this procedure was the quickest means of removal of the foetus and the uterus to prevent any further bleeding from that source." The patient recovered after a very stormy post-operative period. In Rademaker's opinion the high blood pressure and the sudden muscular effort caused the rupture of hepatic vessels, which had been rendered pathological by the toxaemia. In the case here reported there was nothing in the history to suggest the presence of a toxaemic state, nor was there any record of a violent muscular effort. Rademaker further suggested that perhaps some of the sudden deaths occurring in eclampsia might be due to undiagnosed rupture of the liver.

Spontaneous rupture of the liver also occurs rarely as a complication of some pathological condition in that organ, the chief causes of which are carcinoma, syphilis, and such febrile states as malaria, typhoid fever, and pneumonia. Still less frequently rupture has occurred as a result of a biliary stasis and arteriosclerosis. Devic and Bériel (1906), having reviewed the literature, formulated the theory that haemorrhage was the cause of the rupture in these spontaneous cases, whereas in traumatic cases rupture was the cause of the haemorrhage. In the spontaneous cases they considered the sequence of pathological events to be infarction, hypervascularization at the periphery, and rupture of a vessel. Clearly a gumma or carcinoma by eroding through a blood vessel may cause a haemorrhage, as an aneurysm or haemangioma may rupture spontaneously. None of these possible aetiological causes is to be found in the present case.

Case Report

At 10 p.m. on Sept. 25, 1945, Mrs. A., aged 42, was admitted to hospital as an "acute abdomen" case. Apart from the usual childhood ailments—e.g., scarlet fever, measles, and chicken-pox—she had remained well until the day of admission. She had had two former pregnancies, both of which had terminated in normal deliveries, nine years and six years previously. The children were alive and healthy, as also was the husband. The present pregnancy was of 16 weeks' duration, and the patient, who had been well throughout, had not sought medical advice. Twelve hours before admission she experienced sudden violent abdominal pain. At this time she was seated peeling potatoes and had not at any time during the morning done anything calling for muscular exertion. The pain was localized to the right hypochondrium, and was of such intensity as to cause collapse. She was put to bed, where she remained until her transfer to hospital.

On admission the patient's appearance was one of marked pallor and anxious depression. She lay curled up on her left side and moved only with great effort. She complained of generalized abdominal pain, particularly on deep inspiration. The abdomen was enlargtd but moved on respiration. A small umbilical hernia was present, the dome of which was observed to be bluish in colour. On palpation the uterus was enlarged to about 1 in. (2.5 cm.) below the umbilicus, and this was consistent with the period of amenorrhoea. There was generalized tenderness without rigidity but with a relative resistance of her right upper rectus muscle. On percussion, shifting dullness was found to be present; the area of hepatic dullness was normal. Rectal examination revealed an enlarged uterus and generalized tenderness; no other mass was palpable. The pulse was of poor volume, the rate 140 per minute; the temperature was 99.4° and the blood pressure 110/70. Urinary examination revealed a specific gravity of 1020 and no abnormal chemical constituents. A pre-operative diagnosis of haemoperitoneum, probably due to a gynaecological cause, was made.

A blood transfusion was begun and an operation was performed one hour after admission. The anaesthetic administered was nitrous oxide, ether, and oxygen. A right lower paramedian incision was made. On opening the abdomen the peritoneal cavity was found to be full of blood. The pelvis was inspected, but no cause for haemorrhage could be found in the uterus or its adnexa—the only abnormality being a small follicular cyst of the right ovary. The incision was continued upwards, the spleen was inspected and found to be normal, clots were seen in the right hypochondrium, and blood was coming through the foramen of Winslow. The gastro-hepatic omentum was incised and blood clot was found in the lesser sac. A transverse rupture about 2 in. (5 cm.) in length was located in the caudate lobe of the liver. At the place of rupture the liver appeared as though it had been incised by a knife, the edges of the laceration being clean-cut; apart from the rupture the liver seemed to be normal. The laceration was bleeding actively, and surface diathermy was used in an attempt to stop it. This was unsuccessful, and the rupture was then plugged with a piece of the right rectus muscle. This brought about the arrest of the haemorrhage. The abdomen was closed in the usual manner without drainage. The patient, who was in poor condition, was returned to the ward, and the transfusion was continued until a total of three pints (1.7 litres) of blood had been given.

Post-operatively the patient made a rapid recovery. She miscarried on Sept. 30, but, apart from a temporary mental confusion with rise of pulse and temperature, suffered no ill effects. A blood examination carried out on Oct. 11 revealed that the Wassermann and Kahn reactions were negative. The haemoglobin was 60%, red cells were 2,790,000 per c.mm., white cells 3,600 per c.mm., and colour index 1.07. The differential white cell count was 73% polymorphs, 18% lymphocytes, 1% eosinophils, and 8% hyalines.

The patient was discharged from hospital on Oct. 18, 1945. The wound was then soundly healed and she was symptom-free.

Follow-up.—On Dec. 11, 1945, the patient attended the follow-up clinic in the out-patients' department. She looked amazingly well and was symptom-free. Her blood picture had improved considerably, as the haemoglobin was now 95%, the red cell count 4,890,000, and the white cell count 7,600. The blood-pressure reading was 120/80.

Conclusion

With the conspicuous absence of positive findings one is left to speculate as to the possible cause of this unusual condition. One fact may be worthy of consideration: even after such a massive haemorrhage as the patient had sustained she still had a systolic blood pressure of 110 mm. Hg. Further, attention may be drawn to the apparent discrepancy between this blood-pressure reading and the rapid (140 per minute) feeble pulse and profound state of shock which she displayed on admission. Is it, then, reasonable to suppose that she was hypertensive before the rupture occurred, and that this hypertension superimposed on the hyperaemic pregnant liver caused the rupture of the organ? If this assumption is correct it would be consistent with the findings in the case reported by Rademaker.

Summary

The literature concerning "spontaneous rupture of the liver" has been reviewed briefly, and particular attention has been drawn to the only case on record of spontaneous rupture complicating pregnancy. A further case is here described, and it is interesting that both have terminated successfully. The aetiology in the present case is very obscure, but it is suggested that the rupture may have been caused by a sudden hypertension. Spontaneous rupture of the liver should be borne in mind when seeking a cause for intraperitoneal haemorrhage of hidden origin.

I wish to extend my thanks to Mr. J. Gaymer Jones and Mr. D. Maxwell for their permission to publish this case.

BIBLIOGRAPHY

Abercrombie, James (1844). *London med. Gaz.*, **34**, 792.
Devic, E., and Bériel, L. (1906). *Ann. Derm. Syph.*, Paris, **7**, 642.
McEwan, J. S. and D. (1938). *Ann. Surg.*, **107**, 473.
Mast, Wm. H., and Streamer, Charles W. (1933). *J. Amer. med. Ass.*, **100**, 1684.
Mazel, M. (1914). *Rev. Méd. lég.*, **20**, 238.
Rademaker, L. (1943). *Ann. Surg.*, **118**, 396.

Medical Memoranda

Unusual Sequel of a Large Overdose of Insulin

The following case of prolonged and profound hypoglycaemic coma seems worth recording on account of the following features: (1) the huge dose of insulin; (2) the prolonged hypoglycaemia in spite of large doses of glucose; (3) the persistence of mental symptoms for a considerable time after the correction of the blood sugar, and the subsequent complete recovery of normal mental function.

CASE HISTORY

A man aged 25, a known diabetic for 13 years, was recently stabilized on 30 units of soluble insulin twice daily and a diet of 240 g. of carbohydrate. In the 1940 air raids he was badly concussed, and has since been treated at the Maudsley Hospital for depression and "mental absences."

On the evening of July 7, 1945, he took his usual dose of insulin and his supper. He went out, returning at 10 p.m. rather quieter and more depressed than usual. An hour later he told his mother that he had taken a very large dose of insulin for no known reason. It was found that he had emptied a 10-c.cm. ampoule of 80 units per c.cm. soluble insulin which had been in use only 3 days, and it may be presumed, therefore, that he had taken a large part of the 560 units remaining in the ampoule. His mother said that he then took 3/4 lb. (340 g.) of sugar by mouth and returned to bed. Next day at 6 a.m. he could not be roused, and 1¼ hours later he was admitted to King's College Hospital in hypoglycaemic coma. On examination he was found to be deeply comatose, flaccid, and sweating profusely. The pulse was slow and bounding, rate 52, and the blood pressure 130/80. All deep reflexes were absent. He was given 30 g. of glucose intravenously, and immediately became rigid, started shouting, and was difficult to control. A further 20 g. of intravenous glucose was given, and he became just able to drink, though irrational and noisy. An hour later the blood sugar was found to be 45 mg. per 100 c.cm., so more glucose was given by mouth, and the patient seemed quieter though still mentally confused. At noon he became drowsy again, and a further 20 g. of glucose was given intravenously and more by mouth. However, the latter was almost immediately vomited together with undigested food from supper the previous night. Half an hour afterwards his blood sugar was 34 mg. per 100 c.cm. in spite of the 70 g. of glucose so far given intravenously. It is interesting to note the continued fall in blood sugar in spite of the large and repeated doses of glucose.

The patient's general condition was still deteriorating, so 5% glucose-saline was given intravenously, and by 6 p.m., after 2 litres (=100 g. glucose), the blood sugar was 210 mg. per 100 c.cm. In spite of this raised blood sugar the patient remained confused and restless, and became violent and maniacal on the slightest stimulus. Morphine 1/4 gr. (16 mg.) and other sedatives, such as paraldehyde and hyoscine, were given four-hourly throughout the night without good effect. At 2 a.m. the intravenous glucose-saline was discontinued after 5 litres of fluid had been given, and after a stomach wash-out the patient was able to retain sugar drinks by mouth. His carbohydrate intake was then adjusted by mouth, and small doses of insulin were given to prevent ketosis. In spite of normal diabetic control, the patient's mental condition was completely unchanged. With 6 gr. (0.4 g.) of sodium gardenal he slept throughout the morning of July 9, and at noon his blood sugar was 190 mg. per 100 c.cm. He continued in a deep sleep until early afternoon, and then awoke very drowsy but mentally clear and orientated. He had complete amnesia for the whole incident since supper-time on July 7. He made an uneventful recovery and was seen again a fortnight later at the Maudsley Hospital, where little change in his mental state was reported.

I wish to thank Dr. R. D. Lawrence for his help in preparing this paper.

HELEN JORDAN, M.B., B.Chir.,
Late House-physician to the Diabetic Department, King's College Hospital.

Reviews

HISTORY OF MALARIA IN AMERICA

Malaria in the Upper Mississippi Valley, 1760–1900. By Erwin H. Ackerknecht. (Pp. 142. $2.00.) Baltimore: The Johns Hopkins Press. 1945.

It has always been difficult to correlate the facts about malaria prevalence in America with the epidemiological features of this disease in the Old World. The reason is easy to appreciate, for malaria in the New World is not an age-long established disease in indigenous races as it is almost everywhere in the Old World, but one associated with the unique conditions of a continent peopled within a few hundred years by white pioneer settlers and their descendants. We know nothing about what the conditions were before this settling, even whether malaria existed at all, and, except for the efforts of a few writers to probe into the darkness, very little about malaria during the early years of American occupation. A recently published rather remarkable monograph entitled *Malaria in the Upper Mississippi Valley, 1769–1900*, by E. H. Ackerknecht of the Johns Hopkins Institute of the History of Medicine, is therefore of unusual interest, since it is a record of a very complete and exhaustive investigation of this whole subject. Not only does it give the story of malaria in America in a more complete form than has ever been done before, but as an epic of the history of earlier pioneer settling it makes fascinating reading.

After pointing out the great difficulties which surround any effort to obtain quantitative information imposed by the absence in those times of any adequate knowledge of malaria, its confusion with typhoid fever, and so on, the author takes up in detail the material he has collected regarding each one in turn of the five States comprising the area dealt with—viz., Illinois, Missouri, Iowa, Wisconsin, and Minnesota, these States having been chosen as best likely to yield the information desired. In each State there was a long interval (epidemiological latency, the author terms it) before malaria became prevalent—a strong argument for the view that malaria was not indigenous in the Western Hemisphere in pre-Columbian times. This period of healthiness was succeeded by such prevalence of the disease that, as the author says, malaria in the nineteenth century was *the* American disease. The pictures gathered from many sources give a grim insight into what the conditions along the rivers and in other early settlements must have been. With more settled conditions and a more stabilized population there followed everywhere, towards the end of the century, a great decline in the incidence, amounting in a large part of the area to virtual disappearance of malaria (and with it, we may interpolate, the curious high prevalence of blackwater fever in America).

It is not possible in a short notice to do justice to the wealth of detail and great interest attaching to what the author has written in regard to the causes which led to the decline of malaria; suffice it to say that he has closely and objectively investigated each possible factor, including a most instructive review of the part played by quinine—again not quite what might have been supposed and a most illuminating sidelight on the early history of this drug. The work concludes with a very full bibliography of the many sources of information consulted.

REGIONAL ANATOMY ILLUSTRATED

Illustrations of Regional Anatomy. By E. B. Jamieson, M.D. Complete volume. Seven sections. Sixth edition. (320 illustrations. 75s., plus 10d. postage.) Edinburgh: E. and S. Livingstone. 1946.

This work has now been published in a single complete volume, the sixth edition. It comprises seven formerly separate sections: I, Central nervous system; II, Head and neck; III, Abdomen; IV, Pelvis; V, Thorax; VI, Upper limb; VII, Lower limb. These sections can still be bought separately in their original form, each section being fitted into a loose-leaf cover in such a way that any plate can be removed for independent use and afterwards replaced, when desired, in the holder. The total number of plates, many of which have been distinctively coloured, is 320.

In Dr. Jamieson's preface to the sixth edition he gives an account of the origin of the first five sections of the series—

namely, in response to a demand by his students for a permanent record of the blackboard drawings which he made to illustrate his lectures. This demand was met by Dr. Jamieson and his artist at that period, Mr. E. Pierce, who together produced a First Series—Sections I to V—partly on the foundation of the original blackboard drawings, partly by drawings from actual dissections, while others were built up by a process of reconstruction of muscles, vessels, nerves, and other soft parts, on a framework provided by a drawing of the bones of the particular region to be depicted. Later, with the help of the artists Mr. R. W. Matthews and Mr. J. M. Philp, the series was completed by the production in 1936 of Sections VI and VII. The illustrations have the merit of clarity, which is largely due to distinctive colouring and simplicity, the latter being rendered possible by the method adopted of combining previous knowledge of topographical relations of the soft parts, with a foundation consisting of a skeletal framework of the region. The clearness of the drawings has been greatly enhanced by the skilful manner in which the names of the parts are given in full, or as easily recognized abbreviations, and their position indicated by pointer-legends—either black pointers on a neutral white background or white pointers on a black background, as in Plate 169, A and B. Improvements on former editions have been effected in several important respects—namely: (1) replacement of some of the older drawings by new; (2) addition of new drawings; and (3) the enlargement of parts of certain figures, which have been printed as separate plates at a greater magnification—e.g., Plate 98: "Contents of the Middle Ear."

The production of the sixth edition, of *Illustrations of Regional Anatomy* in book form as a single volume, will no doubt satisfactorily supply the demand for such a book as an alternative to the older type of edition, in which the plates comprising each separate section are bound together in loose-leaf covers, and the single volume will be found more suitable for use by graduates and students who have passed the pre-clinical stages of their curriculum.

CLINICAL CARDIOLOGY

Clinical Heart Disease. By Samuel A. Levine, M.D., F.A.C.P. Third edition, revised and reset. (Pp. 462; illustrated. 30s.) London: W. B. Saunders Company. 1945.

The general plan of this work remains unchanged, but a number of additions have been made to bring it up to date. A series of topics has been chosen which cover pretty well the most important points connected with disease of the heart. Each chapter is a self-contained discussion of the matter with which it deals. The treatment is very readable; the author discourses in a pleasant style, drawing much upon his wide experience and quoting interesting cases which illustrate his points. He does not fail to refer to his own mistakes; those experiences are always valuable, for often they are the most instructive.

The book is written chiefly for men in general practice, and accordingly much stress is laid upon the importance of bedside diagnosis without resort to elaborate investigation. Dr. Levine shows fully how very far the unaided senses, when properly trained, can go in the diagnosis of cardiac disease. The book will also be very useful for the senior student and for the general physician; in fact, the cardiologist will read it with interest and profit. The author gives his own views and ideas freely, and many of his reflections are stimulating; all the more so because they differ from those usually made. There is a long section on electrocardiograms—actually nearly a third of the book: this is well set out and most of the illustrations are good. The style is rather too discursive, and it would be easier to assimilate the facts if there was more summarizing. The chapter on heart failure is perhaps the least satisfactory—mitral stenosis is not the best example to take, although it is so common.

SCHEMES FOR MEDICAL CARE IN THE U.S.A.

Prepayment Medical Care Organisations. By Margaret C. Klem. Bureau Memorandum No. 55. Third edition. June, 1945. (Pp. 148. 25 cents.) Washington: United States Government Printing Office.

This report is a significant addition to the evidence of the rapidly growing interest in the United States in schemes for the provision of medical care by insurance of some kind. It gives particulars of 235 schemes in the U.S.A., and 16 in Canada, which were in existence in April, 1945.

The development of these organizations can be traced mainly to voluntary industrial schemes in which both employers and employees took part; but in 1917 the State of Washington passed an Act which required employer and employees to share equally in the cost of medical care for accidents and injuries, and a few other States have followed. Many of the schemes have been fathered by groups of doctors in clinics; others resemble those of our trade unions and friendly societies. Medical societies in various parts of the country, particularly on the Pacific side, have sponsored many of them, and it is estimated that about six million people were entitled to a pre-paid service of some kind in 1945. The extent of these services varies greatly, many of them tending to limit the benefits to surgical care in hospitals. Comparatively few give a comprehensive service, and nearly all of those under the aegis of the medical societies have an income limit. This is not the case in the few which are sponsored by the Government. There were 100,000 doctors in active practice in the U.S.A. in 1943, and of these 44,000 had indicated their willingness to participate in pre-payment schemes.

The report will be found of interest to those who study the growth of the world-wide movement towards making a medical service available in a self-respecting way for those of the community who need it but cannot meet sudden and expensive emergencies. There is little in any of the schemes which is not familiar to members of the profession here, except that the subscriptions seem to be on an ampler scale than in this country.

Notes on Books

The Imperial Bureau of Animal Breeding and Genetics (King's Buildings, West Mains Road, Edinburgh) has issued as one of its technical communications a monograph by JAMES ANDERSON, Ph.D., M.R.C.V.S., of the Experimental Station, Naivasha, Kenya, on *The Semen of Animals and its Use for Artificial Insemination* (price 7s. 6d.). A foreword by Dr. J. E. Nichols, deputy director of the Bureau, notes the wider realization in recent years of the possibilities of artificial insemination as a method to aid the development and improvement of livestock production, especially of dairy cattle, and to control disease. In 1933 the Bureau published a review of the subject by Dr. Arthur Walton; in the present monograph Dr. James Anderson gives a comprehensive summary of the voluminous literature which had accumulated up to the close of 1943, with some later references in a supplement. There is a full bibliography.

Dr. FRANK C. EVE, many of whose writings on the subject have appeared in these columns, has published a small book, *Artificial Respiration Explained* (E. and S. Livingstone Ltd., Teviot Place, Edinburgh; 3s., plus 3d. postage). In Chapter I Dr. Eve explains natural respiration, and in Chapter II artificial respiration (warmth, circulation, ventilation of the lungs); in Chapter III he reviews the situation concerning the three chief methods of resuscitation, and others; in Chapter IV he discusses causes and treatment of asphyxia, and in Chapter V gives brief instructions in the chief methods, including, of course, the rocking method associated with his own name. The text is freely illustrated with line blocks and reproductions of photographs. The language is simple and should be well within the comprehension of any intelligent first-aider.

The Industrial Welfare Society, 14, Hobart Place, Westminster, S.W.1, has issued two new publications: the first, entitled *Directors' Conference*, reports the proceedings at University College, Nottingham, last August, and includes papers by Lieut.-Col. G. R. Hargreaves on "Integration of the Serviceman and Civilian," and Lieut.-Col. T. F. Main on "Some Aspects of Personal Maladjustment." This report of 120 pages costs 3s. 6d. The second pamphlet, entitled *Points for Planners* (price 1s. 6d.), is a guide to firms planning accommodation for welfare and personnel departments in new or adapted premises. There is a section on first aid and health services.

The report of the Director-General to the Council of the United Nations Relief and Rehabilitation Administration for the period April 1, 1945, to June 30, 1945, is published in London for U.N.R.R.A. by Burrup Mathieson and Co. Ltd. This, the third of the series, describes a period of rapid expansion in which U.N.R.R.A. entered upon its first large-scale activities. The main subjects dealt with are supply operations for relief of distress; care and repatriation of displaced persons; health, welfare, and other services; liaison and negotiations; finance; allocation and provision of supplies, including medical and sanitary equipment; and organization and personnel.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY FEBRUARY 23 1946

STREPTOMYCIN IN TUBERCULOSIS

Cures for consumption, like cures for cancer, are strongly suspect by medical men, and rightly so. The high hopes of sufferers from tuberculosis at the prospect of a cure through some drug or serum hailed in the lay press as a panacea have more often than not to be damped down by the medical adviser, for he knows that the tubercle bacillus is much less susceptible to attack by antiserum or antiseptic than most other pathogenic bacteria, and that the chronic fibro-caseous nature of the pathological lesions is an obstacle to the beneficial action of drug or serum. Even the research worker must find his standard of objectivity strained when he senses the expectations of cure in the world of tuberculous sufferers, and it may be imagined that he has to steel himself against disappointment as he tests each new chemotherapeutic substance for its bactericidal action against the tubercle bacillus *in vitro*. The sulphone promin (promanide in England) has so far been the most promising of the new drugs in experimentally infected animals; but clinical results, except possibly for local tuberculous lesions, have been disappointing, and the drug has at the therapeutic level a considerable degree of toxicity. Penicillin is ineffective, but the new antibiotic streptomycin, a product of *Actinomyces (Streptomyces) griseus*, was found to be bacteriostatic to the tubercle bacillus in relatively low concentration in the test-tube (100 units or 0.3 mg.%), and the results of its use in experimental infection, together with a preliminary clinical report, indicate that this drug has some curative action on progressive tuberculosis.

The first experimental results reported by Feldman and Hinshaw[1] from the Mayo Clinic showed that streptomycin in a varying daily dosage (1,750 to 6,000 units), given subcutaneously in four or five divided doses, and continued for a period of 60 days, exerted a striking suppressive effect on the progressive tuberculous infection of guinea-pigs after injection with a culture of the human bacillus. The treated animals showed no evidence of toxic effects or anaemia. A further experimental trial by Smith and McClosky[2] of streptomycin and promin separately and in combination has shown that streptomycin is much superior to promin in the control of experimental tuberculosis in the guinea-pig. Of 81 inoculated guinea-pigs (weight 270 to 370 g.), 21 were treated with single daily doses of 5,000 units of streptomycin intramuscularly; 20 were treated with 0.5 g. per kg. promin by mouth; 20 with streptomycin plus promin; and 20 were kept as controls. Treatment was continued daily for three months, and the experiment was ended 105 to 110 days from the date of inoculation at a time when 65% of the control animals had died of advanced tuberculosis. All the animals treated with streptomycin and with streptomycin plus promin were alive and well, 3 of the promin-treated guinea-pigs were dead, and 4 of the 7 surviving controls were losing weight and obviously ill. The average gain in weight was 183 g. for the promin group, 298 g. for the streptomycin group, and 252 g. for the combined treatment group. The average tuberculosis index (rated from the post-mortem findings) was, in comparison with a figure of 10 for the controls, 4.1 for the promin group, 1.9 for the streptomycin group, and only 0.5 for the streptomycin plus promin group. The results from the combined treatment suggest a synergistic action of the two drugs, since the chemotherapeutic efficacy was approximately three times that which would have been expected from a mere summation. Streptomycin had no toxic effects, and seemed to give some protection against the usual anaemia that promin itself causes. When it is realized that promin was being used at a dosage about one-half of its maximum tolerated dose, and the streptomycin at less than 1/20 of its tolerated dose, this new substance has obvious advantages over promin, which hitherto has been regarded as the most effective chemotherapeutic agent in experimental tuberculosis.

That the clinical results from the chemotherapy of tuberculosis cannot be easily evaluated is indicated by the difference of opinion that still exists about the usefulness of gold salts in this disease. For an assessment of streptomycin, controlled trials on carefully selected patients kept under observation for a number of years will be required before any serious judgment of its value can be made. Meanwhile, Hinshaw and Feldman[3] have made a preliminary and guarded report on its use in a small series of patients observed for only a few months. Dosage was 800,000 to 1,200,000 units a day given in amounts of 100,000 to 150,000 units intramuscularly at 3 to 4 hourly intervals for periods up to three months. Toxic effects were mainly confined to histamine-like reactions (headache and flushing of the skin), probably due to impurities, although 4 patients became sensitized to the drug, as shown by febrile reactions when therapy was recommenced after an interval of a few weeks. Among 16 patients with pulmonary tuberculosis *x*-ray examination showed prompt improvement in recent progressive lesions, especially in the fine, widely distributed lesions, which appeared to be of haematogenous origin. On the other hand there was little obvious effect on the common types of fibro-caseous tuberculosis: cavitation remained and sputum continued positive despite large doses of streptomycin. Also reactivation of an apparently healed or healing lesion was noted in a few cases after treatment with the drug was stopped. Local treatment of four cases of tuberculous empyema was disappointing. Five patients, each with a solitary kidney and with tuberculosis of the genito-urinary tract as shown by the presence of tubercle bacilli in the urine, were treated, and four responded well. Tubercle bacilli disappeared from the urine in 2 to 4 weeks, and the urines remained microscopically negative for periods of 1 to 4 months after cessation of treatment. The fifth patient had in addition

[1] *Proc. Mayo Clin.*, 1944, **19**, 593.
[2] *Publ. Hlth. Rep. Wash.*, 1945, **60**, 1129.
[3] *Proc. Mayo Clin.*, 1945, **20**, 313.

evidence of miliary tuberculosis. The lung lesions showed marked improvement on *x*-ray examination, but the patient's clinical condition was not correspondingly improved and tubercle bacilli were continuously excreted in the urine. In two other patients with early miliary tuberculosis the lung lesions also regressed, but the clinical condition did not show a parallel improvement.

The authors conclude that the use of streptomycin in tuberculosis should be limited meanwhile to the treatment of early and haematogenous forms of pulmonary tuberculosis, tuberculosis of the genito-urinary tract, suppurative lymphadenitis, and early miliary tuberculosis; that treatment should be supplementary to other proved therapeutic measures; and that a cautious attitude should be preserved about streptomycin in tuberculosis until the results of fuller studies are available. Streptomycin is particularly active against Gram-negative bacteria, and it is being used clinically in America for such infections as cystitis and pyelitis, typhoid, dysentery and Salmonella infections, *H. influenzae* meningitis, and tularaemia. But the greatest use for this new antibiotic—if its early promise is sustained—will be in tuberculosis, and it is to be hoped that supplies of the drug, preferably home-made, for controlled experimental and clinical trials will soon be available in this country.

A CERTIFICATE AND DIPLOMA OR DEGREE IN PUBLIC HEALTH

Under the special powers given by the Medical Act of 1886 the General Medical Council prescribes the courses and the nature of the examinations for postgraduate qualifications in public health. For many years the courses and examinations have been in two parts: the first designed to extend the student's knowledge of the basic sciences, especially of bacteriology and parasitology, and of physics and chemistry, as related to the problems concerning a public health department; the second devoted to the clinical, social, administrative, and legal aspects of the work of a medical officer of health. Until the end of the first decade of the present century most of those who qualified for such a diploma or degree became either part-time or whole-time medical officers of health. The laboratory work and tuition in the basic sciences covered by Part I was valuable, indeed essential, because undergraduate instruction in them was elementary, because health officers in those days were often responsible for chemical and bacteriological examinations, and because most of those who qualified actually did become medical officers of health.

Circumstances began to change with the placing on local authorities of responsibility for such personal health services as the school medical service, maternity and child welfare, the prevention and treatment of tuberculosis, venereal diseases, and the care of mental defectives. It soon became clear that only a proportion of the medical men or women taking up those branches of public health work would obtain, or even aspire to, posts as medical officer of health. The growing administrative responsibilities of this officer and the extension of knowledge and specialized methods in chemistry and bacteriology made it impracticable for him to carry out laboratory duties. But the form of the D.P.H. courses remained substantially unaltered, although their duration and content were increased from time to time. Specialization within the public health service was not recognized by any academic qualification. The D.P.H. remained the standard means of entry to the public health service.

New rules promulgated by the General Medical Council, to operate from Jan. 1, 1946, aim for the first time at a rational method of training medical officers for work in public health departments under modern conditions. Two courses, preliminary and final, are prescribed. The first extends over one academic term of whole-time, or its equivalent of part-time, study. Its subject-matter includes the history of public health and its law, the functions of authorities and the nature of their public health services, social security, international health organizations, the study and presentation of mass data as to health, the causal agents of infection, the effect of environment and heredity on mental and physical health, physical education, and the principles of health education. This course is intended for all medical workers in public health, and is, in fact, an extension of the instruction in hygiene or social medicine which is, or should be, given to all medical students. At its conclusion an examination is to be held and successful candidates will be granted a Certificate in Public Health.

Entry to the final course is to be restricted to those who hold the certificate mentioned above. It should be noted that students who fail at their first attempt to obtain this certificate will not be able to go straight on to the final course, although it is likely that most teaching institutions will conduct classes for the final course immediately after the preliminary. This may be regarded by candidates as a hardship, but it will ensure that students in the final course shall have reached a certain standard of attainment and that their advanced studies will not be neglected because an examination, which in any case they would have to pass, is occupying their minds. The final course, which is to extend over at least five calendar months of whole-time, or its equivalent in part-time, study, is vocational, and includes subjects formerly dealt with in Parts I and II of the former rules, but with a different approach. They comprise physiology in relation to public health, bacteriology, mass aspects of disease, sanitation and environmental hygiene, interpretation of plans, statistics, administration, public health law, mental health services, occupational health, and methods of public education in health. While the teaching institutions are free to conduct as much of the teaching on laboratory lines as they think desirable, the licensing bodies will be under no obligation to examine candidates in laboratory technique. Clinical instruction in infectious diseases may, as formerly, be spread over three months, or be concentrated in four weeks of hospital residence. Practical instruction in public health will involve five months' attendance at a health department. The final examination, which qualifies for a degree or diploma in public health, is to include written papers; a clinical test in infectious diseases; an oral test in infectious diseases, epidemiology, and general and special hospital administration; a general oral test; and a dissertation on a public health subject. Instead of the former unsatisfactory practical

examinations in food inspection and inspection of premises, students are to keep a day-book of their practical work throughout the course and examiners are to take account of it in assessing marks.

In some ways the new courses will be more exacting than the old for students, and also for teachers, because instruction will be more demonstrational and not merely supervisory, as so much laboratory instruction tends to be. There are, however, exemptions from classes for students with appropriate clinical or public health experience, and the combination of academic study with approved part-time practical occupation, which the scheme makes possible, should provide a good training for medical officers of health. It should be clearly understood that the new system is intended to provide an adequate basic training in public health, by means of the preliminary course and certificate, for all officers wishing to work in a public health department. The limited numbers who aim at being medical officers of health will go on to the diploma; the others, presumably, will seek a higher qualification in the particular specialty in which they are engaged, whether it be child health, tuberculosis, infectious diseases, venereal diseases, or some other recognized field of public health work. It is to be hoped that employing bodies will fall into line and cease to require all entrants to the service to hold a diploma or degree in public health.

FLUORESCENT TRACERS

In this age of atomic energy much work has already been done on the use of radio-active isotopes for tracing the metabolism of compounds in the animal body. And now, following the identification of tubercle bacilli by fluorescence microscopy, it is interesting to read that the property of fluorescence is being used to trace the location of particles in tissue.

Yagoda and Donahue[1] have shown that many minerals the dust of which is toxic are also represented by natural specimens having the property of fluorescence under ultra-violet rays. The fluorescent mineral is identical with the more abundant non-fluorescent ones in gross chemical composition, hardness, density, and solubility; it differs only in containing a trace constituent held in solid solution which serves as an activator for the transformation of ultra-violet rays to visible light. The fluorescence of these substances, inhaled as a finely divided dust, persisted after being acted on by tissue fluids and reagent solutions used in the preparation and staining of thin sections. The sections of the lung on a slide could also be incinerated at 400° C. in a muffle furnace without destroying the fluorescence of the mineral dust; the fine dust particles were in fact best observed in the resulting ash pattern. Yagoda and Donahue describe experiments with three fluorescent materials: willemite, a zinc silicate with an intense green fluorescence; hyalite, a hydrated variety of amorphous-free silica with a pale-green fluorescence; and scheelite, a calcium tungstate with a fluorescence which varies from blue to yellow according to the molybdenum content. The lungs of a rabbit were insufflated with powdered willemite which passed a 100-mesh screen, and, after 18 hours, examination of the lungs and trachea under ultra-violet light showed the dust adhering as a continuous film on the mucous lining of the trachea and as scattered collections on the cut lung surface, and microscopical investigation disclosed that the particles were located within the bronchi and alveoli. In the second experiment hyalite was injected subcutaneously into a rabbit, which was killed 30 days later. Sections of the nodules at the points of injection, when examined under ultra-violet rays, revealed the presence and distribution of the foreign dust particles by their characteristic pale-green fluorescence. Lastly, animals were exposed for several months to scheelite, and here fluorescence microscopy showed the particles to be located in dense deposits within the interalveolar septa, usually in the vicinity of small- to medium-sized bronchi. Finely granular, evenly distributed particles were also seen in the septa, and in lesser amounts uniformly distributed throughout the lung. Some was found in the periphery of the peribronchial lymph nodes.

This work suggests that fluorescent-tracer technique may become a valuable method of histochemical investigation of inhaled dust, particularly in laboratory investigations designed to simulate conditions in mining or industry. The fluorescent mineral may be used as the dust for investigation, or it might be added in small quantities to the non-luminous variety; or where a fluorescing specimen of identical chemical composition is not available the tracer technique might be used by adding a fluorescent inorganic preparation having density, solubility, and particle size distribution similar to those of the dust under investigation; it might be assumed that wherever a fluorescent particle was observed it was accompanied by the dust.

[1] *J. industr. Hyg.*, 1945, **27**, 193.

STUDENT HEALTH SERVICES

The Social and Preventive Medicine Committee set up by the Royal College of Physicians of London in 1942 has now presented a third interim report, giving further and closer attention to its earlier recommendation "that student health services should be available in every medical school, and that under the general supervision of the head of the department of social and preventive medicine they should be used as an instrument of teaching." No final decisions could be reached as to the medical staffing of such services, especially in regard to the provision of treatment, until more was known about a National Health Service. It was also premature, for the same reason, to set out any details of a "student health centre" of the type suggested in the committee's original report. Nevertheless the evidence, mainly from students themselves, revealed such a disquieting position that it seemed urgently necessary to bring the matter to the notice of university authorities. Moreover, though the committee originally confined itself to the narrower question of the health of medical students, it became clear that all university students must be considered. The present report therefore takes up the broad issue of health services for the undergraduate (and the resident graduate too) and gives guidance on general lines of policy without going into detailed suggestions. The evidence before the committee has convinced it that there is a serious amount of sickness among university students; that many university authorities are almost wholly indifferent to any measure of preventive medicine; that facilities for care of sick students (except those suffering from serious illness) are sadly deficient; and that matters of diet and lodgings are in some instances given only perfunctory attention from the point of view of health. The recommendations, briefly summarized, are as follows: (1) Universities should accept greater responsibility for the health of students. (2) Arrangements should be made for medical examination after entry and periodical examinations during the student's stay, to detect physical and mental disabilities and to indicate available means for

securing advice or treatment. (3) Medical and nursing care should be provided for students who are ill. (4) Inspection of lodgings should be done by special officers of the university, who should pay attention to the health aspects of all lodgings. (5) Steps should be taken to improve the diet of students, including the provision of canteens and other facilities, under the advice of a dietitian. A valuable field for education in food values is available in the universities but is entirely neglected at present. (6) Universities and colleges should consider the appointment of a medical officer for the general supervision of student health.

METHYL ALCOHOL POISONING

It is well known that methyl alcohol is a highly toxic substance and causes blindness, but the occurrence of 60 cases of poisoning in U.S. Navy personnel in the islands of the S.W. Pacific seems an incident worthy of record. Jacobson, Russell, Grimm, and Fox[1] reported 18 cases; 6 of the patients died. The methyl alcohol was intended for use in testing for leaks of Freon gas from refrigerators. It was in containers labelled "alcohol" and "methyl alcohol" and not carrying poison labels. In each instance the poison had been mixed with water and fruit juices and then drunk. Another account comes from Kaplan and Levreault[2] of 42 patients, of whom 13 died. Here the alcohol was found in captured Japanese fuel drums. The liquor was not left in containers which could be mistaken for drinking purposes, but, despite warnings, the sailors succumbed to the smell of alcohol. It was shared and served in a mixture of orange, pineapple, and other fruit juices in a proportion of three of fruit juice to one of alcohol.

The high mortality rate and the relatively large number of patients made the incidents the most important single cause of illness that occurred during this particular naval operation. The symptoms were those of alcoholic intoxication—drowsiness, headache, photophobia, blurring of vision, dyspnoea, nausea, and vomiting within 24 hours. In most patients blurring of vision and dyspnoea persisted up to 72 hours. Ocular abnormalities consisted of various degrees of loss of colour vision, beginning with loss of green colour sense and central vision. Most urines were acid and contained albumin, acetone, and hyaline and granular casts. The blood contained between 1 and 5 mg. of alcohol per 5 c.cm. All those brought to hospital in coma died. They showed cyanosis of the upper portion of the chest, face, and finger tips; cold, moist, clammy skin; dilated fixed pupils; slow laboured respiration, and rapid, thready pulse. Necropsy findings included cyanosis, intensified post-mortem rigidity, marginal emphysema of lungs, subpleural and subpericardial haemorrhages, small areas of necrosis of liver, oedema and mucosal congestion of stomach and duodenum, swelling of kidneys, and oedema and congestion of brain and pia-arachnoid. The patients were treated with gastric lavage, enemata, magnesium sulphate, repeated intravenous injections of 5% dextrose in saline, and large amounts of sodium bicarbonate, both orally and intravenously. The eyes were protected against light during the acute stage of the poisoning, and if amblyopia persisted.

These authors agreed with Roe[3] that acidosis plays an important part in producing symptoms. The body treats methyl alcohol by oxidizing it to formaldehyde, which upon further oxidation forms formic acid. This is thought to act by inhibiting the normal oxidation processes by forming a complex compound with iron. Other substances, such as formaldehyde and lactic acid, may help in the production of acidosis. It is interesting to note that Roe suggests that the oxidation of methyl alcohol is checked by the consumption of ethyl alcohol, and states that all sign of poisoning may be averted if it is drunk before or repeatedly after the consumption of methyl alcohol.

1 *Nav. med. Bull., Wash.*, 1945, **44**, 1099.
2 Ibid., 1945, **44**, 1107.
3 *Acta med. scand.*, 1943, **113**, 558.

RHEUMATIC BRAIN DISEASE

It is common knowledge that rheumatic fever may involve the central nervous system, Sydenham's chorea being the best-known example. Recent research carried out in the United States suggests, however, that the incidence of lesions in the brains of patients with a history of rheumatic fever is far greater than has been realized before. In a review of his work Bruetsch[1] has pointed out that in only one of thirty patients who had rheumatic valvulitis was the brain free from changes. These changes consisted of obliterating endarteritis of the small meningeal and cortical vessels with subsequent gross or microscopical softenings in the cerebral cortex. They are clearly distinguished from cerebral embolism occurring in patients with mitral stenosis during auricular fibrillation. Involvement of the brain may arise many years after the acute stage of rheumatic fever. The possibility that these lesions may give rise to mental symptoms led Bruetsch to study a group of 500 consecutive necropsies in a mental hospital. He found evidence of rheumatic heart disease in 5%, as compared with an estimated figure of less than 1% for the general population. Among schizophrenics the incidence was as high as 9%. Bruetsch discusses a possible causal relation between rheumatic fever and various types of mental disease, but it is clearly desirable that any such conclusion should be deferred until more statistical evidence is available. Even if further work should confirm the results obtained by Bruetsch, the relation between schizophrenia and rheumatic disease might well prove to be of a concomitant nature, not unlike that of tuberculosis, which is also said to be relatively frequent in schizophrenics.

It has been stressed by Bruetsch and others that the vascular changes in the brain are not pathognomonic of rheumatism, but may also be found in other conditions—for example, bacterial endocarditis. It remains to be seen whether recent work on allergy may throw light upon the pathogenesis of the lesions, which are not unlike those described in anaphylactic experiments after protracted sensitization.[2] This would place the rheumatic lesions in line with periarteritis nodosa, for there is now strong experimental[3] and pathological[4-6] evidence that this condition is an allergic reaction, and, perhaps, also with thromboangiitis obliterans. Both conditions are now assuming some neuropathological importance, as they appear to affect the brain more often than was previously known.[7-9]

1 *Arch. intern. Med.*, 1944, **73**, 472.
2 Ferraro, A., *J. Neuropathol. exp. Neurol.*, 1945, **4**, 1.
3 Rich, A. R., and Gregory, J. E., *Johns Hopk. Hosp. Bull.*, 1943, **72**, 65.
4 Miller, H. G., and Nelson, M. G., *Lancet*, 1945, **2**, 200.
5 Rosenak, B. D., and Maschmeyer, R. H., ibid., 1945, **1**, 305.
6 Gibson, P. C., and Quinlan, J. T., ibid., 1945, **2**, 108.
7 Malamud, N., *J. Neuropathol. exp. Neurol.*, 1945, **4**, 88.
8 Scheinker, I. M., ibid., 1945, **4**, 77.
9 Davis, L., and Perret, G., *Trans. Amer. neurol. Ass.*, 1942, **68**, 12.

The main library of the Royal College of Surgeons was not seriously damaged when other parts of the building were bombed, and the books have now been returned to the shelves. Several tons of books had been evacuated to Downton Castle, Ludlow; Alfrick Court, Worcester; and the National Library of Wales. Rearrangement of the Library is now proceeding and the Reading Room is open once more to students from all parts of the world.

NOTES ON THE PSYCHOLOGY OF PRISONERS OF WAR

BY

A. L. COCHRANE, M.B., B.Ch.

Capt., R.A.M.C.

Prisoners of war have of late enjoyed and suffered much of the limelight, psychological and otherwise, but in general it is the late, rather degenerate, form of the species—" the ex-Kriegie " or " liberated P.O.W."—who has kept the centre of the stage, and there are, I think, still some points about the psychopathology of imprisonment which merit discussion.

A word about terminology: I have throughout used the word " Gefangenitis "—chiefly because I like it; but it must not be read to imply any pathological condition. It is of course impossible to say what the normal reaction to P.O.W. life should be; even if adaptation is taken as a criterion there is a further difficulty. Those who were best adapted to imprisonment found the greatest difficulty in readapting in England. The Freudian criterion of ability " to work and to love " is also of little help in differentiating " normal " prisoners in a solely male population where most work helped the enemy. It is used here simply to describe the psychology of Gefangenen.

Acute Gefangenitis

One of the most interesting facts about the psychology of imprisonment antedates the surrender, and it is odd indeed that it should have attracted so little attention. I spoke about this to a very large number of prisoners, and the extraordinary fact emerges that practically none of them even considered the possibility of their being taken prisoner. My own case is fairly typical. I knew for five days that we were fighting a rearguard action on Crete; I had a good idea of what had happened at Dunkirk and in Greece; I visualized death and wounds fairly often during that period, but I never thought of being taken prisoner, although the impartial observer, had he been about, would probably have put our chances of being taken prisoner at about 2 to 1 on, even on the first day. It would seem, therefore, that there was some strong unconscious factor inhibiting normal reasoning. The " censor " apparently " passed " thoughts of death, while " blue pencilling " thoughts of imprisonment—a fact suggesting that rather deep unconscious factors are involved—and it appears reasonable to look for some general psychological reaction among those who were taken prisoner.

It is unfortunately difficult to write with certainty about those early days. There were no mass-observers about, and each prisoner had other interests more pressing than a minute dissection of his fellow prisoners; still, the general impression was so striking that a generalization can be risked. The simplest way is to describe the extreme case, not the average. He will be lying down, alone, and will be silent. If others are near he may exchange a few words, but will, oddly enough, not grumble. If one asks how he feels he will almost certainly tell you to " f——k off," but if pressed will say he's " b——d " or " dead." In appearance he will be dishevelled and dirty and unshaven, even though water be plentiful and he has a razor in his pocket. Orders and requests by his own officers will have no effect on him; he will obey his captors slowly and sullenly. He will be deaf to all ideas of escaping, will often be surprisingly uninterested in food. Such were the extreme cases, which were not rare; but nearly all showed something of the syndrome.

Those prisoners whom I saw on the north coast of Crete after the surrender had been well-disciplined soldiers a few days before, interested in their appearance, and full of initiative. Since then they had made severe physical exertions; they had been hungry and probably thirsty; they had been heavily bombed and seen their fill of sudden death; they had been separated from their officers, and they honestly believed that the Higher Command were dithering incompetent idiots.

With such a mass of possible factors it is at first difficult to say whether the actual experience of being taken prisoner had any effect. One is tempted to say that they had been through so much that the final result is not surprising; but a short examination shows that there are certain difficulties inherent in the obvious explanation.

Hunger and thirst do not usually lead to inactivity—quite the reverse; the belief that the Higher Command were dithering idiots, although common in the Middle East at that time, did not usually have such catastrophic effects. Many, too, had been separated from their officers during the retreat and had retained their discipline and initiative, but when hospitals were reconstituted after capture there was no return to law and order. It is true that they had lost the stimulus of fighing, but they still had the duty of escaping. Yet it is remarkable how few escapes took place in the early days of captivity, although the opportunities then were plentiful. The bombing was severe in Crete; but it was a thing of the past, and can hardly have been responsible. Fatigue is admittedly a possibility; but the worst fatigue was over, and they were capable of further great exertions under German orders. It therefore seems possible that part of the syndrome, at any rate, was due simply to being taken prisoner.

Subjectively my own memory of the period is chiefly one of colossal inertia, which was thrown into relief by the fact that I had a lot to do. I was working at a small hospital, and as I was the only German-speaking M.O. had a fair amount to do in addition to the ordinary medical work. I remember waking each morning and being unable to get up. I was not tired—I was just apathetic; it was often an hour before the remnants of my Presbyterian conscience drove me down to start work. And during the whole of that period every act, every decision, required an effort out of all proportion to the circumstances.

I was very forcibly reminded of another prisoner I had seen during another war. He was a Moorish cavalryman who had been slightly wounded and brought to our hospital. He died—although his wound was of no importance and there seemed no other medical cause for death. There appeared to be a very definite connexion between the Moorish *felo de se* and the symbolic death of our acute gefangenitics.

Subacute Gefangenitis (Dulagitis)

The new prisoner reaches his first transit camp a few days or a few weeks after capture. He looks forward to it as a centre of some sort of organization; it brings hopes of letter-writing and regular meals, baths, and modern sanitation. He is nearly always bitterly disillusioned. He was, at any rate, in 1941 at Salonika, which was the first transit camp for all prisoners captured in Greece and Crete. I was there from June to Nov., 1941, and it is on my experiences there that this part of the article is based. I have, however, discussed the matter with other M.O.s who were in the Libyan and Italian camps, and the pattern appears fairly constant.

Here again there is an excess of factors, all possibly effective, so that it is difficult to distinguish cause and effect. There was first of all hunger: on a diet of 1,000 calories everyone is nearly always hungry. There was also almost always a marked shortage of water. Nearly everyone had diarrhoea, and most of them hypoproteinaemic oedema; the sanitation was deficient and primitive to a degree; overcrowding was appalling; and there were innumerable bed-bugs. The nervous tension of the camp was kept at breaking-point by shooting inside the wire every night and often during the day. The news in the second half of 1941 was not very good, and morale was very low. The average P.O.W. arrived at the transit camp still in the apathetic stage, and the psychopathology of transit camps really consisted of the fate of apathy. There was inevitably one group of prisoners who remained apathetic; they became more and more horizontal, ceased washing, and ceased caring. They were difficult to treat; a few died of intercurrent infections.

The other symptoms are best considered under various headings.

(i) " *Midsummer Madness.*" — People normally sensible and eminently reasonable did or said things which showed they had completely lost their sense of proportion. I give two examples from officers who might be expected to have retained their equilibrium better than others: (*a*) There were relatively few M.O.s at one period, and as we were receiving only 1,000 calories we wished to share out the work. One doctor refused to work, saying he wouldn't work unless the Germans gave him more food—regardless of the fact that it meant others had to do more work in his absence. (*b*) A padre asked me to translate a letter into German in which he

expressed his undying devotion to the Führer! When I expressed anger and astonishment he seemed very surprised. Associated with this was a certain amount of collaboration with Germans, among both Serbs and British. One case was particularly disastrous to the British in the camp. These people were "strangers and afraid in a world they never made." They had woken up in a new world where the old standards no longer existed and where they searched in vain for new.

(ii) Appearance of neurotic symptoms as seen on the sick-parades. There were numerous hysterics and hosts of hypochondriacs.

(iii) *Various Aggressive Tendencies.*—These were directed against the Germans and, oddly enough, against their own officers (including M.O.s!). In conversation no officer who left Crete, free, escaped the most biting criticism, and death did not save many others from the most vicious attacks. It was also typical that the attacks were launched in the foulest possible language. The extent of the feeling can be judged from the fact that it was generally assumed, without any evidence to support it, that one very senior officer had committed suicide. It also appeared between the various national groups present in Salonika—i.e., Australia, New Zealand, Ireland, England, Scotland, India, Cyprus, Palestine, Yugoslavia. There were some bitter fights between the various national groups. This feeling was very carefully fostered by the Germans.

(iv) *Theft.*—This was widespread, affecting all ranks and all nationalities. People normally slept on all their worldly possessions, and took them with them on parade. Distrust was complete. I remember being unable to sleep at night because I had left some reserve food with such respectable people as the Friends Ambulance Unit. I am happy to say that it was still there in the morning.

The picture is admittedly complex, but I think a certain simplification can be introduced by discussing the acute "hunger" syndrome separately. I saw its effects at various other times, and it is reasonably well known. (We were on 1,000 calories diet, so the use of the word "hunger" is really justified.) The first signs are increased motor activity directed towards getting food, accompanied subjectively by irritability and the hunger pangs. Then follows a fairly rapid deterioration of the conscience, characterized in Salonika by first stealing from the Germans, then from other P.O.W.s, and then from one's friends. Next, activity gets gradually less, and finally apathy appears if the diet is low enough. This apathy does not appear until there are obvious signs of malnutrition.

If we then, as it were, subtract this syndrome from the whole symptomatology of "dulagitis," there remain the "midsummer madness," the neurotic symptoms, and the ill-directed aggression, appearing as apathy disappeared. The continuing state of apathy could be seen as a continuation of two separate tendencies. It is therefore reasonable to suggest that the psychological mechanisms involved in the early stages of imprisonment probably consist of normal aggression being directed inwards, producing the picture of apathy or symbolic death, and that in the recovering process there is a period of "feeling lost" associated with ill-directed aggression and escapist hysteria.

The reason for this profound effect of imprisonment is harder to guess, but the fact that death was considered by the "censor" preferable to imprisonment suggests that rather deep layers of the unconscious were involved. It is possible that this surrender of male to male involves some unresolved residue of the Oedipus complex.

Chronic Gefangenitis

(a) Psychological Medicine

In general, psychological medicine in imprisonment was very similar to that in peacetime. There were the same anxiety neurotics, hypochondriacs, compulsive neurotics, hysterics, and psychotics as in normal life. Whether they were more numerous than usual no one knows; no statistics or comparable group is available. One inevitable difference was the extent of malingering. It was very difficult for an Army doctor to change from the habitual severity with malingerers to an attitude of complacence if not actual encouragement. In many cases the differential diagnosis between psychoneurosis and malingering was very difficult. Most prisoners felt it their duty to malinger as much as possible to decrease the German war effort, and this idea strongly reinforced any hypochondriac tendency.

Another point of interest was the national preference for particular organs among the hypochondriacs. The French always complained about their livers; the Serbs had an odd pain round both rib-margins; the Russians had pains in their backs; the British concentrated on their stomachs, with the "effort" syndrome a good second. The Germans, I gather, had roughly the same interests as the British, but their doctors tended to treat the effort syndrome with cardiazol (leptazol) and strophanthus.

One learned in time how to cure them. The French could always be cured by injections—they preferred injections of liver, but that was too much for my conscience! The Serbs always reacted to massage, the Russians to heat. A barium meal was found to be best for the British stomachs (it was effective before any results were known), and psychotherapy for the effort syndrome. It is probable that the doctor's mistakes of one epoch produce the type of hypochondriac of the next! In 1943 and 1944 it was interesting and frightening to watch the growth of the Tb. neurosis, as the routine *x*-ray examinations were carried through without any adequate explanation.

Had I done more psychotherapy it would have been interesting to generalize about the aspects of P.O.W. life which had produced the strain causing the appearance of the neurosis. Actually the majority of the neuroses I saw were deep-rooted in civilian life; of the others I can only say that "repressed aggression" seemed the best way to describe what had caused the trouble. Let me give an illustrative case.

A Scot of about 30 was admitted with various complaints, diagnosed as effort syndrome. Psychological treatment was difficult as he refused to talk, but after a few days he came into the open on the subject of why he was not sleeping. He started telling me his dreams, and I was suddenly involved in a very vivid description in broad Scots of a long and very bloody massacre of Germans. His previous psychological history was all right, but he had developed a passionate hatred of the Germans in France in 1940 and during the surrender at Saint-Valery, which was not decreased by the march into Germany. At the beginning he tried violence with Germans—but found, like so many others, that it did not pay. He had then tried to work it off on his companions, but they got quickly tired of it: after two weeks of it myself, I did not blame them. He had then developed his heart symptoms and his sleeplessness. I did not attempt to analyse the case any further, but let him work off his feelings and tried to direct his energies towards escaping and sabotage, with some success. Other similar cases could be cited, but they would have no statistical importance.

(b) Sex

The secret sexual lives of prisoners were much less lurid than one might have thought, but they were not without interest. There were first of all the secret normal lives in defiance of the mediaeval German racial laws. They were far more numerous than one would have imagined. There was a certain tobacco factory in the IX area whose history would make a good "Tommy by Warlight" and would doubtless have a great success, and the barbed wire became the linear descendant of the locksmith in its relation to love. Less romantically there was a very definite increase in masturbation. This in general did little harm; but there were a few who became depressed and worried, feeling grossly guilty and fearing all the classical fates of madness, feebleness, and impotence.

As regards homosexuality, the most obvious sign of it was the popularity of dances among the P.O.W.s, which were widespread. The extent of actual sodomy was very hard to judge, not only because it was concealed from M.O.s but also because of its sporadic appearance: there would be a great deal in one working party, where it spread rapidly by a sort of infection, while neighbouring working parties would have none; but the general incidence was probably very low. The cases of which I heard fell into the following groups. (*a*) Those initiated by a P.O.W. who had been an active homosexual before the war. One of these stated—for what it is worth—that "P.O.W.s were much more easily seduced than civilians." It happened that I treated two who had been seduced in this way, for non-psychological complaints, but they spoke to me about it and claimed to have had heterosexual imagery throughout. It appears to have done them no harm, apart from some increase in guilt feelings. (*b*) Those initiated by regular soldiers, who had not previously been homosexual. There seems to be a vague homosexual tradition among regulars, and they turned to it when bored. In general, homosexuals were treated more sensibly by P.O.W.s than by civilians.

I have the impression that sexual abstinence did not prove such a psychological strain as might have been expected.

(c) Hunger and Economic Factors

British prisoners were not chronically hungry in general. The Red Cross parcels prevented that; their diet was monotonous, but they were rarely hungry. On the other hand, there were numerous groups of P.O.W.s who were much less well off than the British—e.g., French, Serbian, and Russian. In "mixed" hospitals these groups met, and one was able to judge the effect on behaviour of small groups, living on different economic levels, under otherwise identical conditions. The calorific levels were approximately 2,900 (British), 2,100 (French), 1,700 (Serbian). A "class" system established itself at once, the British "hiring" for food or cigarettes French or Serbs to do their washing and other dirty work; the French employed the Serbs. Ill-will followed rapidly on both sides, but it was striking how much more vocal and aggressive the higher-calorific groups were in criticizing the lower as regards the quality of their work and their demands for payment.

I was able to carry out a questionary on a group of Serbs as they left the hospital. A Serb cadet officer acted as intermediary, and no one suspected that it was being done. The questions asked were: Do you think more or less of the British after meeting them in this hospital, and why? The result was that 87% thought less, and the reasons given were: "their bloody condescension" and "their damned parcels." The first on analysis proved to refer to the way in which the British gave them occasional food and cigarettes—an interesting example of the failure of charity to solve economic problems. It is certainly true that the parcels saved our health, but it is equally true that they ruined our reputations.

It is obvious that these feelings were partly nationalistic, but it was made very clear, at another hospital, how important the economic factor was. This was a hospital solely for tuberculosis, and permission was obtained to give all patients British parcels. This hospital was even more international than the other, but the international rows were very much fewer. I also had an opportunity of experiencing this problem myself. It happened that the staff of one hospital consisted of two French M.O.s and one British (myself), and ten British orderlies. As the French M.O.s got very few parcels, my standard of living fell considerably below that of my orderlies. I remember being amused and ashamed at my irritation with what I felt was my orderlies' condescension, and by the general increased friction between the orderlies and myself during this period.

It must be stressed that in all these cases the "lower" class has been on a very low economic level, and are therefore not comparable with the conditions in civilian life. It was unfortunate, too, that no groups presented themselves when the differences were solely qualitative and not calorific, but the whole was impressive evidence for the importance of the economic factor.

General

Apart from all these minor groups of psychological phenomena, it is reasonable to ask if there were any general phenomena appearing among P.O.W.s which might be attributed to the effect of imprisonment itself. I have discussed this with many P.O.W.s, and there seems to be general agreement about the following two: (i) increasingly frequent attacks of bad temper; (ii) increasing lack of enterprise and initiative, leading in some cases to apathy. In general one could say that the first year was spent in adaptation, the second was the best year, the third began to be a strain, and the fourth and following years left no one unscathed.

The simplest and most probable explanation of these is again, I think, the problem of aggression. Mechanically it is easy to visualize the syndrome as being due to the aggression slowly turning inwards, with occasional "break-through" to the outer world. Theoretically it is not, I think, surprising that aggression should loom so important in Gefangenitis. Sex and food deprivation produced no major conflict in themselves; they merely caused aggressive hate directed towards the Germans, and this increased aggression, perpetually tantalized by the barbed wire and the ever-present guard, could find few outlets compatible with survival as a prisoner. Hence the conflict and the neurosis.

The Returned P.O.W.

On this basis one would naturally expect the returned P.O.W. to have difficulty in coping with this suppressed agression, and that in general he would be "in revolt"; but on this subject there are many more objective observers than myself, and I feel it is better left to them, with, however, the plea that some attention should be paid to the psyche of repatriated prisoners. At my own medical board there was not one question which could in any way be construed as showing interest in my feelings, and they did not even measure my B.P. !

Another point worth making is about their guilt feelings. These are very strong among repatriated P.O.W.s. It is not perhaps generally recognized that this is a new phenomenon caused by liberation. Little was seen of it among P.O.W.s while still in captivity. It is part of the liberation syndrome, which has been freely confused with "Gefangenitis."

DENTISTRY IN NATIONAL HEALTH SERVICE

TEVIOT COMMITTEE'S FINAL REPORT

The Interdepartmental Committee on Dentistry under the chairmanship of Lord Teviot, which was set up nearly three years ago, has completed its work. It issued an interim report in November, 1944,[1] in which it recommended a comprehensive dental service as an integral part of the Government's national health scheme. It will be recalled that the White Paper declared that a dental service must be an exception to "comprehensiveness" because there were not, and would not be for some years, enough dentists to provide it. The final report of the committee is now published.[2] In many respects it accords with the report of the Goodenough Committee, and applies to dental education some of the recommendations to which the Goodenough Committee gave a wider reference.

Recruitment of Dentists

The number of dentists practising in Great Britain is just under 14,500. The committee states that up to a total of about 20,000 there is no likelihood of securing entrants more quickly than they are needed. To achieve a total of 20,000 in 20 years will call for an intake into the profession of just over 800 a year. The student entry will have to be larger than this because of the proportion of students—about 10%—who fail to qualify. In pre-war years the annual student entry was only 340, and during the war it fell below 300.

Although so similar to medicine in training and practice, dentistry may, owing to its more restricted field, lack the appeal which medicine makes to the young person in search of a career. The work may seem distasteful to many. It imposes the strain of continuous application to precise operations and confinement to the chair-side. The range of financial reward is not as high as in medicine, particularly for salaried posts, yet dental education is costly for the student, and after qualification he may require considerable capital to set up in practice.

The committee suggests certain measures for bringing dentistry to the attention of public and secondary schools. The dental schools also should make themselves well known to potential students. It may be expected that the increasing appreciation of dental health and the rising demand for treatment following the inclusion of dentistry in the National Health Service will have its reflection in the added status and attractiveness of the profession.

Dental Education

It is considered by the committee that all dental schools should be integral parts of a university; at present two schools (Edinburgh and Glasgow) are not. The Government, the universities, and the dental teaching hospitals should make available to dental students better educational facilities than exist at present. The first problem is to find teaching staff of requisite quality. Teachers should be encouraged to engage in dental research and to study all developments of their subject, and should have sabbatical leave. All teaching appointments should be adequately remunerated with graded

[1] *British Medical Journal*, 1944, **2**, 765.
[2] Cmd. 6727. H.M. Stationery Office, Kingsway, W.C.2. Price 1s.; post free 1s. 1d.

salary scales, reasonable increments, and superannuation rights. The Goodenough Committee recommended a national range of salaries for medical teachers, and the same should obtain for dental teachers.

At present four universities, although they have medical schools, do not provide facilities for the teaching of dental school students. It is considered unlikely that Oxford will be able to contribute to dental education in the near future. Cambridge is understood to be prepared to assist. The establishment of a dental school at Aberdeen might eventually be explored by the university. In Wales favourable consideration is likely to be given to the establishment in Cardiff of a complete course of training for a degree in dentistry. It is hoped that all the schools will in future admit women students.

More could be done in offering financial assistance to prospective students. As a short-term policy a certain number of State scholarships designated to dentistry should be offered for open competition. Loans as distinct from scholarships or bursaries are not regarded as desirable. Awards should not be conditional upon the student's undertaking public dental service after qualification. The need for better postgraduate education is stressed, and a postgraduate teaching school in London is recommended. To meet the cost of improving and extending dental schools and adequately remunerating the teaching staff the committee recommends a Government grant of £1,250,000 for capital expenditure, with annual grants of £150,000, rising to £300,000 within five or six years.

Government of the Dental Profession

The committee (except for one dissenting member) urges that dentistry should now be self-governed instead of being within the orbit of the General Medical Council. The separate Dental Council which would replace the Dental Board would include one representative from each of the 16 universities or corporations granting degrees or licences in dentistry, eight direct representatives of dental practitioners, three Crown nominees, and, for the purpose of education and examination functions, six members appointed by the General Medical Council. The committee makes one comment here:

"An independent position need not be an isolated position. Had we thought that these proposals would lead to the isolation of dentistry from medicine in general we should have rejected them. Our view is, however, that the professional association of doctors and dentists can be all the closer and more cordial when each profession is self-governing. . . ."

The dissenting member, Major-Gen. J. P. Helliwell, holds that it would be a profound disservice to dental education if the Dental Board were reconstituted as an independent council, and he adds that although the General Medical Council agreed to the proposal it did not "seem to show any great enthusiasm for the transfer of its functions with regard to dental education," and only agreed to it on condition that the reconstituted council should include additional members from its own body. He quotes the President of the General Medical Council as stating in his evidence before the committee that he was of opinion that dentists should possess a basic medical qualification.

Certain amendments of the law are suggested by the committee in the light of its proposal that a comprehensive public dental service be instituted. One suggestion is that means be taken to bring to an end the shops to which the public are invited by advertisement to bring dentures for repairs without the intervention of a dentist.

Dental Research

The encouragement of dental research is regarded by the committee as a duty of the whole community. The necessary funds should be voted by Parliament, and the reconstituted Dental Council should be divested of the obligation, under which the Dental Board laboured, to devote surplus funds for certain purposes, including research. Existing agencies for dental research should be utilized, and not only should there be a dental member on the Medical Research Council but that body should be advised by a Dental Research Committee.

"The need, stated in its simplest terms, is that much more dental research of high quality should be done. We need to acquire further knowledge of the oral tissues in health and disease and of their relation to general fitness; to find and assess methods of applying that knowledge in order that dental disease may be prevented; to determine the best means of treating dental disease; and to establish standards for the drugs and materials which a dentist employs. Dental disease (including disease of the oral tissues) is one of the most common of all diseases. The committee have proposed that the community should undertake a responsibility for the dental treatment of all who need it. It therefore becomes a public duty as well as being manifestly in the public interest to find out what causes dental disease and how it may be prevented."

It is added that diet is a subject of outstanding importance in dental research, although there are also many other subjects which perhaps do not catch the public understanding so easily and which have an immediate bearing on dental health.

Finally the report deals with the question of ancillary workers. After setting out the arguments for and against any delegation of the dentist's work to operative assistants, the committee unanimously recommends that the institution of any scheme of that kind should await proof of a shortage of dentists to work the comprehensive dental service. A scheme for the training of "dental hygienists," whose work should be limited to the scaling, cleaning, and polishing of teeth and the instruction of patients in the technique of oral hygiene, always of course under the responsible direction of dentists, should, the committee recommends, be initiated immediately on such a scale as to provide an adequate test of their value.

The committee held 24 two-day meetings and received oral evidence from 35 organizations and individuals.

HUNTERIAN DINNER AT THE COLLEGE OF SURGEONS

John Hunter was born on Feb. 14, 1728, and died on Oct. 16, 1793. The Hunterian dinner in commemoration of his birthday was held, under an endowment of the year 1813, at the Royal College of Surgeons of England, Lincoln's Inn Fields, on Feb. 14 for the first time since 1939. The revival of this festival, after the war years and the partial destruction of the College building, was made noteworthy by the presence of many men of high rank in public and professional life, including 22 of the 31 Trustees of the Hunterian Collection, headed by the Lord Chancellor of England, Lord Jowitt. The number of trustees at the dinner would have been 25 in a company of more than 130, but the Prime Minister, the Chancellor of the Exchequer, and the Secretary of State for War had to call off at short notice owing to the need for them to attend an important debate in the House of Commons. The guests were received by the President, Sir Alfred Webb-Johnson, Bt., and the Vice-Presidents, Sir Max Page and Sir Heneage Ogilvie, in a part of the ground floor which few could recognize as the scene of havoc depicted in a photograph taken after the air raid in 1941.

When "The Memory of John Hunter" had been honoured in silence the toast of "The College" was proposed (in the absence of Mr. Attlee) by Lord Jowitt, who said that the great traditions of British surgery had won the heart of the country in war and in peace. The Government wanted to bring the best type of recruits to surgery and give them a proper reward, because the active support of the medical profession was essential to any scheme of national health service. Though he could not now say more on the subject he knew that this view was firmly held by his colleague Mr. Aneurin Bevan, who was present at the high table but was not speaking that night.

The President expressed the pleasure of the Council in greeting four Ministers of the Crown, five Ambassadors from foreign Powers, and many representatives of the Dominions, which emphasized the imperial and international value and significance of the College and of its proudest possession—the Hunterian Collection and the great Museum which was built round that original nucleus. The medical profession had been rendering service to the utmost of its strength all through the trying times of war, and in this home of surgery he wanted to pay a special tribute to their colleagues of the nursing profession and to the gallant women who drove the ambulances with care and consideration through the terrors of the blitz. When the time of trial came to the College itself much was spared in the holocaust; though it had been impossible to evacuate scores of thousands of specimens from the Museum many were safely stored, and thanks to Sir Hugh Lett's Heraclean labours many

were rescued and the library had been evacuated to safe areas. Much progress was afoot with plans for restoration and for carrying them out. Sympathy and encouragement had poured in from all sources, from the King to the humblest worker in the biological sciences, and from all parts of the world came gifts and promises of future help. Not only had the munificence of Sir William H. Collins already provided an endowment of £200,000 for the scientific departments but the President was able to announce that Sir William had just made a further gift of £100,000 to the College on certain conditions. This then was no ordinary occasion: it marked a milestone in the history of the College. The plans now in hand provided for enlarged museum space, extension of research rooms, rooms for separate study and common-rooms for postgraduates from all parts of the world, extensions of the library, and a great conference hall. The Wellcome Trustees made a magnificent gift, and the Council valued equally with this their collaboration and the help of Sir Henry Dale, so that a group of medical museums could be established in London that would be a Mecca for students from all countries. Thus they carried on the great Hunterian tradition. For the heads of the two Sections of Pathology and Anatomy the Council searched the world for men of the highest attainments and secured the services of Prof. R. A. Willis, of Melbourne, and Prof. F. Wood Jones from Manchester. With their expert help it would set about restoring the greatest possession of British medicine, one of the bases of biological knowledge—a great staff college of learning built up round the collection of the founder of scientific surgery.

The President read a message sent that day to the King expressing deep appreciation of His Majesty's constant interest and encouragement as Visitor of the College, and adding that, thanks to the generous support of scientists in all parts of the world, good progress was being made in the heavy task of restoring the unique museum. The King replied from Buckingham Palace saying:

> "Please convey to the members of the Council and Court of Examiners of the Royal College, and to the Trustees of the Hunterian Collection, my sincere thanks for their kind message. As Visitor of the College, I am very glad to hear that the anniversary of John Hunter's birth is once more being observed in the customary manner, and that such generous help towards the restoration of the Hunterian Museum has been forthcoming from your fellow-workers in so many countries."

The health of the guests was proposed by Sir Max Page, and Dr. Wellington Koo, Chinese Ambassador, and Mr. A. V. Alexander, First Lord of the Admiralty, both replied, the former drawing an analogy between a major surgical operation and war and its aftermath; and the latter paying tribute to the great and grand work of Service doctors of every rank. Sir Heneage Ogilvie proposed the health of the three Hunterian Orators since 1939—Prof. A. H. Burgess, Mr. Victor Bonney, and Prof. G. Grey Turner—and contrived in a few words to set forth the character and achievement of the man whom the College delights to honour from generation to generation. Prof. Grey Turner, Hunterian Orator for 1945, replied to the toast.

TECHNICAL ASPECTS OF CREMATION

It has been authoritatively estimated that in the next twenty years the number of cremations in Great Britain will reach a quarter of a million per annum, or about half the total death rate. At present there are in operation 58 crematoria (36 owned by local authorities or joint boards and 22 by private companies), and in 1944 there were 39,016 cremations—an average of 675 at each place. With the gradual change of public opinion on the aesthetics of cremation versus burial it is anticipated that the average will rise to 1,000 a year, and that the number of crematoria will be 250. Some 200 new crematoria are, in fact, planned for erection when building conditions permit. The progress of the movement was more rapid in the immediate pre-war years than at any time in its history, and it will be accelerated during the post-war reconstruction period, when many problems concerning the alternatives of using valuable land for cemeteries and erecting crematoria of appropriate design will call for solution. The fuel technologist as well as the cremation advocate has been responsible for much of the progress. Of the 58 crematoria now operating, 47 employ gas as the incinerating medium, four are coke-fired, five (one of which uses both gas and electricity) are heated by electricity, one uses oil, and one "bottled" gas. Many cremations are carried out in the hot chamber using preheated air only. There are now eight furnaces at Golders Green. Conversions have been made from coke to gas at Golders Green, Manchester, Sheffield, Hull, Woking, and Liverpool, and further conversions are in prospect. Recent developments have been directed to improvements in technical operation, the application of heat, and the provision of "recuperation" for heating the air required for oxidation. The time required for a complete cremation with gas-heated furnaces varies within narrow limits, about 75 to 90 minutes being typical. Wide differences exist between human bodies, but incineration can usually be carried out in a hot furnace with the aid of preheated air from the recuperator only.

The first really modern incinerating furnaces were installed in this country about 1923. The gas incinerator of to-day is the outcome of long experience, improvements having been made from time to time in the last twenty years. A special burner has been developed which operates with a fan under low pressure for the air supply; this speeds up the cremation and is more efficient. The waste flue gases are conveyed to a tower by rectangular flues, the products of combustion being exhausted into the atmosphere well above the level of the ground. In the natural-draught furnace the burners are arranged in a combustion zone in the ash-pit chamber, which is immediately beneath the grid hearth-bricks or the coffin supports. Where no other manufactured fuel is available the coke-fired cremating furnace is in use.

SUMMER SCHOOL IN SOCIAL BIOLOGY

The British Social Hygiene Council will be holding a residential Summer School in Social Biology, at Wadham College, Oxford, from Aug. 1 to 15. It is being planned to illustrate the scientific approach, through biology, to human life and culture, as well as the ways in which the biological sciences find application in individual and social life. It is designed to appeal to teachers in all types of schools, and others concerned with education. The main course of lectures will deal with broad aspects of social biology of interest to specialists and laymen alike; the evening lectures will be given by distinguished visiting biologists and social workers. A series of practical demonstrations, and of visits to scientific institutions, research departments, and other places of interest in and around Oxford is under arrangement. The fee will be £14 14s. Further particulars may be had from the British Social Hygiene Council, Tavistock House North, London, W.C.1.

Reports of Societies

PENICILLIN TREATMENT OF OSTEOMYELITIS

A combined meeting of the Sections of Orthopaedics and of Surgery of the Royal Society of Medicine was held on Feb. 5 for a discussion on the treatment of acute osteomyelitis with penicillin. Mr. W. B. FOLEY presided.

Mr. VAUGHAN HUDSON described a laboratory and clinical investigation conducted at the Middlesex Hospital. It comprised 37 cases of acute or subacute osteomyelitis in which penicillin had been used. In 30 of the cases the organism was *Staph. aureus* and in 7 *Str. pyogenes*. In the majority, when the case came under treatment, the infection had been present for some days; only 2 were seen as early as the fourth day. The youngest patient (who died) was 1 year old; the oldest (who recovered) was 70. In 6 cases, had penicillin not saved the life of the patient and given time and opportunity for the focus to be discovered, the patient would have died with the cause of his mortality unrecognized. It was proper that the results of penicillin treatment should be regarded with the greatest reserve. The vagaries of this disease were well known, and were exemplified by one of these patients who, after many vicissitudes, recovered from a gunshot osteomyelitis of the femur, after surgical operation, in 1918 and remained well for twenty-five years until he spontaneously developed a recurrence of the disease in the second world war.

The severity of the disease varied very much from year to year and from patient to patient. In one patient there might be a multiplicity of foci, in another the whole of one bone might be affected, and in a third the disease might be localized to one small area. The organism had a peculiar property of hibernation, and if operation was done during the hibernating period the organism was rarely discovered. It was soon apparent that penicillin swept the organisms from the blood stream and reduced the acute lesion to a chronic one, the

subsequent fate of the patient depending upon the management of a chronic osteomyelitis. This was true of 34 of the 37 cases. In 13 of the 34 penicillin proved at once successful, and so far there had been no recurrence. In 7 an abscess was formed in the soft tissues and was treated by stab drainage. Two of these had a subacute exacerbation two or three months after their discharge from hospital, which responded to a second course of penicillin, and they had remained free from recurrence. In a further 7, under cover of the course of penicillin, dead and infected bone was removed. One had a doubtful recurrence, which responded to a second course of penicillin and had since remained well. In the remainder of the 34 an attempt was made to see whether the drainage of bone and soft tissue as a primary procedure would be an improvement on penicillin alone or on penicillin with stab drainage. Of these, 5 had a persistent or chronic sinus.

The average dose was 20,000 units of penicillin administered intramuscularly every three hours day and night for ten to twelve days. Later in the series the dose was raised to 60,000 units three-hourly and the results were better. When it was considered what amount of work the penicillin had to do to reach the organism within the affected tissue it seemed probable that the duration of treatment should be nearer to that of subacute bacterial endocarditis, in which permanent results were not obtained until a minimum of twenty-one days' treatment had been reached. Local penicillin as an adjunct to systemic made no difference to the results; indeed, the recurrences were statistically higher. Systemic penicillin localized the infection to the initial site, and complications, so far as was known, were cured or prevented. Primary union had been achieved in the face of infection and the dissemination of infected material prevented. The prophylactic use of penicillin gave uniformly good results, the penicillin acting as an umbrella in the surgery of the infected lesions. If it were possible to give penicillin treatment earlier a higher percentage of cases could be cured. Penicillin was a very valuable weapon, but a great deal still remained to be learned about it.

Need for Surgical Drainage

Dr. J. TRUETA described some 30 cases treated in the course of eighteen months at the Wingfield-Morris Orthopaedic Hospital, Oxford. The organism was *Staph. aureus* in 25 of the cases. Penicillin given intramuscularly by drip was almost invariably used. At first 100,000 Oxford units a day were given, but lately the dosage had been increased to 400,000 units the first day, 200,000 on the second day, and thereafter 100,000. This second method had the advantage of making the treatment shorter, though the total amount of penicillin was about the same—namely, more than 1 million units. The first case of the series was treated only with penicillin, and within twenty-four hours the general condition improved; the local condition also showed great benefit. The second case, which also was started with penicillin alone, did not respond so well. Though the general condition improved, an infiltration of the soft tissues developed, clearly a subperiosteal abscess, and the damage to the bone was so extensive that the lesions were seen to be still active a year after the beginning of treatment. It was felt that such cases should be treated with penicillin and surgery when needed—that is to say, when an infiltration indicating a subperiosteal abscess was present. They were encouraged to do primary sutures in all the remaining cases of the series.

Systemic penicillin alone could cure this disease provided that there was no abscess (which penicillin could not sterilize), that the dosage was adequate, and that the course of treatment was continued long enough. In the cases in which an abscess was already present the systemic infection might be controlled, but even after clinical recovery the disease in the bone made progress and led to extensive bone destruction. Surgical drainage was as essential in this disease as in other infections susceptible to penicillin. Of these 30 cases not one had been lost, and there were no instances of metastatic foci or joint involvement. The total dosage of penicillin given was, on the average, 1 million units, the maximum 3 millions. The shortest effective course was six days and the longest fourteen days.

Mr. CLIVE BUTLER gave the results of the treatment of 14 acute cases, all of which had recovered. He believed that penicillin had reduced the mortality in this condition from 25% to 3 to 5% by controlling or preventing the blood infection which so often accompanied an acute osteomyelitis. In fulminating cases penicillin therapy should be started within two days if infection was to be controlled. The average dose was 100,000 units daily for at least two, and probably three, weeks. If the drug was stopped too soon there was danger of return of general or local infection. Clinical improvement was generally rapid, though the temperature might persist for some time. The recovery was of a decisive character, not seen in those cases treated with one of the sulphonamides. His conclusions were that if penicillin was used during the first days of the disease complete resolution might occur; if it did not, immobilization of the affected limb should be prolonged in cases showing extensive bone involvement. There was no longer any justification for the closed-plaster treatment in this disease.

Mr. R. W. BUTLER (Cambridge) said that acute osteomyelitis in the days before penicillin was known to be a very variable disease. The mortality depended largely upon whether or not it took the form of a fulminating blood-stream infection. Sometimes it seemed that the earlier the infection localized the better. It was not easy to predict what was going to happen when the case was seen during the first day or two. Therefore it was very hard to say what penicillin had done, though it had certainly greatly lowered the mortality rate.

Dr. R. E. REWELL spoke of a number of acute fulminating cases of osteomyelitis in all of which penicillin had made a difference to the general state of the patient. Dr. MARTIN BODIAN said that at the Children's Hospital, Great Ormond Street, the plan was followed of giving 1,000 units of penicillin per lb. (454 g.) of body weight every twenty-four hours. Injections were given by the intramuscular route every four hours, except in children over 5, when the same dosage was given every three hours. The repeated aspiration of the abscess was important. One single aspiration was not enough; it should be repeated every day or every second day until such time as no more pus could be obtained. A much lower total dosage was given at the Children's Hospital than had been advocated by the openers of the discussion. An infant of 15 lb. (6.8 kg.) body weight would receive 15,000 units a day, which meant 200,000 units for the full course of treatment, and very rapid results were obtained.

RENAL FUNCTION IN PREGNANCY

At a meeting of the North of England Obstetrical and Gynaecological Society in Sheffield on Feb. 1 Dr. C. G. PAINE read a paper on the "Interpretation of Kidney Function Tests." He explained how a renal function test, by assessing mass function, might easily indicate good function even when considerable anatomical damage to the kidneys had actually occurred, and similarly how a poor function test should always be of clinical significance. A combination of the urea concentration test, the Van Slyke, and the Fowweather tests was used, with two non-protein nitrogen estimations.

In a case of early toxaemia of pregnancy renal function tests should be performed after delivery as well as before delivery. One of three things might happen following a pregnancy toxaemia: *(a)* a rapid return to normal function; *(b)* a prolonged condition of kidney deficiency, which he called "the post-toxaemic state"; and *(c)* the secondary hypertensive state. In his experience a return to normal function was relatively uncommon. In the post-toxaemic state there was a good concentrating power compared with the secondary hypertensive state; in the latter there were lower clearance values and a greater nitrogen retention under load.

Discussing the management of a case of toxaemia of pregnancy after delivery, Dr. Paine suggested that the important factor was adequate rest, which was difficult to obtain outside hospital. The duration of the raised blood pressure during the pregnancy toxaemia was important. He found that the secondary hypertensive state followed the post-toxaemic state far more often in those cases in which the blood pressure had remained persistently high and pregnancy had been allowed to continue in the hope of getting at least one living baby.

Three cases were also described and fully discussed at this meeting: a case of Meigs's syndrome, by Mr. C. R. MCDONALD; a case of carcinoma of the cervix obstructing labour, by Mr. N. L. EDWARDS; and a case of pregnancy and myasthenia gravis, by Mr. GLYN DAVIES.

Correspondence

Psychology of the One-eyed Man

SIR,—The article on this subject by Lady Duke-Elder and Dr. E. Wittkower (Feb. 2, p. 155) deserves the careful attention of all concerned, both employers and medical examiners. Grievous wrong has been done in the past to men so handicapped, largely through our imperfect understanding of their cases. Let us hope that with better knowledge of their psychology we shall avoid the mistakes of the past.

Having made more than a thousand ophthalmic examinations for pensions after the last war I think there is one point that deserves emphasis. Again and again I found one-eyed men attributing some defect of vision in their remaining eye to the loss of the other eye. They argued that one eye had now to do the work of two, and must, therefore, be severely strained. Any defect of vision in the remaining eye due to astigmatism or other error of refraction was accepted, wrongly, as inevitable and incurable. It should be pointed out to these sufferers that this view is entirely mistaken. A one-eyed man is in one way less liable to eye-strain than before the loss of his eye. All strain arising from errors of muscle balance, such as hyperphoria and/or weak convergence, are eliminated, presumably, by the loss of one eye.—I am, etc.,

Banstead, Surrey. HERBERT CAIGER.

Ocular Signs in the Prisoner of War from the Far East

SIR,—Since the days of Clive the description of the European released from an Asiatic prison—half-starved, covered with sores, and exhibiting signs of food deficiency—has generally included the words "half-blind." Families with the Indian Army tradition will have heard such stories about their forebears amongst the prisoners of the Black Hole of Calcutta, of Tipu Sahib, and of the days of the great English expansion through India. Baird, Stoddart, and Gale are names that spring to mind, and I would wager that investigation would reveal a high incidence of central scotoma. To come to our times, the literature of the preceding thirty years for ophthalmic signs associated with food deficiency was summarized by R. H. Elliott in 1920 (*Tropical Ophthalmology*). Unfortunately his work had received only passing mention in the standard textbooks of this country until the recent war against Japan. There is nothing new under the sun, and here with these unfortunate partly blinded prisoners of war we have a problem that has engaged the attention of clinical observers over the past fifty years. It used to be said that the great charm of ophthalmology was that it was the one branch of our art that could approach science in its precision. Therefore our care must be to get the ocular signs of this syndrome defined and limited before we become embroiled in controversy over the various subdivisions of dietetic deficiencies in our search for the cause.

In May and August, 1945, Capt. W. M. Rich and I examined a small number of men that had been released at Rangoon. Doubtless some of these men were also examined elsewhere, but at the time of our original article we had not the benefit of the experience of other observers. Our report was sent for censorship in September, and after various vicissitudes was only finally published in the *Journal* of Jan. 5 (p. 20).

Our conclusions were that there were discrepancies between the ocular signs previously described and those exhibited by our cases after their arrival in England. The outstanding points appeared to be that there were no ocular muscle pareses, no peripheral visual field constriction, and that the number of men with signs of a bilateral retrobulbar neuritis (I use the term advisedly) was high, whilst the scotomata to white targets seemed to show a characteristic "tailing" but had some affinity to those of the toxic amblyopias. We also tried to review the relevant literature from the ophthalmic point of view, pointedly skirting ariboflavinosis rather than plunging headlong into a morass of speculation on dietetic deficiencies.

Reports on similar cases can be found in the December copies of the *British Journal of Ophthalmology* and of the *Journal of the Royal Army Medical Corps*. From these reports it would appear that the patient while in Asia exhibits his scotoma, is sometimes deaf (two cases only of the 219 examined have been sufficiently deaf to force the examiner to raise his voice beyond conversational level, and neither of these manifested scotoma), has considerable keratoconjunctival abnormality, and that his legs are more often affected than his arms by his food deficiency ("beriberi" is used advisedly). A blunderbuss of multiple vitamin therapy is discharged at him on his voyage home, which achieves considerable improvement, especially with regard to the state of the lesions of his cornea and conjunctiva (as might be expected). In this connexion Capt. Churchill's article is of considerable value in detailing the prison diet.

Since the time of the Rangoon cases some 219 men (all ex-Japanese P.O.W.s) have been referred to this centre for visual defects by their medical officers. In each case a scotometry has been performed, and to date some 54 have been found to suffer from bilateral central scotoma. I hope soon to be able to correlate these findings. Ridley's description of the Thailand cases (*Brit. J. Ophthal.*, 1945, **29**, 613) showed that, but for the vitamin therapy on the way home, most cases might be expected to show abnormality in limbal vascularization. Even so, a recent annotation in the *Journal* (Dec. 22, 1945, p. 889) has suggested that to the ophthalmologist and his slit-lamp the abnormal limbus is not readily acceptable.

Dr. H. G. Garland (Jan. 26, p. 143) proposed to exclude the B_1 portion of the B complex as a cause for this syndrome, for some reason that he does not state. I regret that I am unable to subscribe to this, as the history of several cases shows that an incipient ocular defect was aborted by the use of thiamin in the prison camps. Rather would I tend to exclude vitamin A, as does Churchill. Vitamin B_1 is most definitely involved.

Dr. Garland and Dr. FitzGerald-Moore have suggested that beriberi is a coexisting deficiency picture. Rather than postulate a further subdivision of disease may I be permitted the following comment. Over forty years ago the Japanese noted a definite time relation between the onset of the scotoma and the set of clinical signs which they knew as beriberi or *karkare*. Some 75% of my 200-odd cases of visual defect have claimed that they have suffered from "wet or dry" beriberi, and the interest is that 45 out of my 54 cases of bilateral central scotoma have a history of this disease with a fairly constant time relation between the onset of the two.

The pathological findings in the C.N.S. in beriberi are those of demyelination, haemorrhages, and subacute inflammation of the white nerve fibres and their surrounding membranes. Even allowing for Kagoshima's report, why postulate a simple degeneration without inflammation in the optic nerve, due to a deficiency of only a portion of the B complex? The December *British Journal of Ophthalmology* (p. 655) notes that Major Maynard of the A.I.F. has returned home with some sections of the brain complete from the eye to the occipital cortex. Until his report is published may I be permitted to retain the expression "retrobulbar neuritis," which fits best into the ophthalmic picture.

In conclusion may I express my profound admiration for the ingenuity and skill in improvisation of the medical staff in these camps scattered throughout Asia, who used any available means to hand from shark liver to red palm oil to allay the ravages of this disease. What does amaze me is that there seems to have been no trachoma reported.—I am, etc.,

G. C. DANSEY-BROWNING,
Major, R.A.M.C.

Ophthalmic Centre, Fenham Barracks, Newcastle-upon-Tyne.

Blindness in the British Commonwealth

SIR,—In a comprehensive survey of this problem (Oct. 27, 1945, p. 557) Prof. Arnold Sorsby states, in reference to the causes of blindness in the African Colonies, "Trachoma is probably rare but not unknown, as was previously believed." So far as Uganda is concerned, trachoma is endemic and is the principal cause of visual disability among Africans. In the sphere of ophthalmic surgery operations for the relief of trachomatous trichiasis-entropion head the list by a long way.

An analysis of 1,000 consecutive case records from the eye department of Mulago Hospital shows: trachoma, 285; diseases of the conjunctiva (excluding trachoma), 164; anomalies of refraction and accommodation, 125; diseases of the cornea and sclera, 79; diseases of the lids, 60; diseases of the uvea, 59; injuries, 48; diseases of the lens, 24; N.A.D. (chiefly tests for fitness as drivers, etc.), 24; diseases of the retina, 23; glaucoma (primary and secondary), 23; diseases of the optic nerve, 21; systemic diseases (including the C.N.S.), 18; helminthic infestation of the eye, 28 (onchocerciasis, 11); ophthalmoplegia, 7; panophthalmitis, 4; phthisis bulbi (bilateral), 3; diseases of the orbit, 3; diseases of the lacrimal sac, 2.

Prof. Sorsby mentions recent studies on onchocerciasis. This condition has been recognized for more than ten years as a serious cause of blindness in certain parts of the Protectorate, notably around the headwaters of the Nile, where the population is exceptionally dense. The 11 cases shown above can give no indication as to its true incidence, for the infected area

is some fifty miles (80 km.) distant from Kampala; these 11 cases had all come from that area. Since we (at present) know no cure for onchocerciasis, its eradication as a cause of blindness is an entomological problem of some magnitude.—I am, etc.,

A. J. BOASE,
Ophthalmic Specialist, Colonial Medical Service.

Mulago Hospital, Kampala, Uganda.

Loss of Vision following Haemorrhage

SIR,—I venture to submit the following notes based on a study of the literature and on my own small experience. It is rare for any individual to have experience of more than one or two cases.

Instances were recorded in young men in the 1914–18 war (Pincus, 1918), and Tidy has stated that "no age is immune."

Papilloedema in some degree is probably present in nearly every case, but may be missed if the examination is not made at an early stage.

Narrowing of the retinal arteries is inconstant and not uniform. The distribution of the affected vessels does not accord with the blind areas in the visual fields as it does in cases of occlusion of a branch of a retinal artery. The type of narrowing is not the same as that present in elderly people who have diseased arteries. Narrowing of the arteries is probably a sequel rather than the cause of the condition.

Cases characterized by central scotoma with little or no peripheral field change have been reported, and, presuming the observation to be correct, suggest a lesion of the retinal ganglion cells or of the macular fibres—a view advocated by Holden. The clinical course of the disease, its signs and symptoms, regarded as a whole suggest the action of a nerve poison rather than a vascular disturbance.

Apart from the work of Holden little, if any, research appears to have been undertaken. Holden bled dogs and found degeneration of the retinal ganglion cells. Mayou reported a case of a dog which became blind after severe haemorrhage from the intestine. Thorough perimetric examination undertaken as early as possible might throw some light on the nature of the condition.

Tidy's treatment by transfusion, liver, and iron seems very plausible, but requires confirmation.

An extensive literature exists. A good account of the condition is given by Groenouw. I append several references not mentioned in the recent correspondence. The condition was apparently known to Hippocrates.—I am, etc.,

H. M. TRAQUAIR.

Edinburgh.

BIBLIOGRAPHY

Groenouw, A. (1915). *Handbuch der Augenheilkunde*, Dritte Auflage, Leipzig.
Holden, W. A. (1899). *Arch. Ophthal.*, Chicago, **28**, 125.
Mayou, M. S. (1914). *Trans. ophthal. Soc. U.K.*, **34**, 319.
Pincus, F. (1918). *v. Graefes Arch. Ophthal.*, Bd. 98, S. 152.
Tidy, H. L. (1941). *British Medical Journal*, **1**, 774.

Juvenile Delinquency and its Remedy

SIR,—The views expressed by Dr. R. H. Ahrenfeldt (Feb. 9, p. 216) concerning the fallacies of statistics relating to juvenile delinquency are undoubtedly sound, but one must question the wisdom of emphasizing, except in theoretical discussion, that the roots of later antisocial actions are deep-seated in the unconscious mind and far back in childhood. Everyone who works in psychiatric clinics for children knows that there are very many cases of theft, breaking and entering, wandering, and malicious damage which never reach official cognizance, and a great many more are undiscovered. So it is that the statistics are misleading.

Juvenile delinquency arises in most cases from one direct cause or a combination of several direct causes. Children who are backward educationally become frustrated with hopelessness bred of constant failure, and may indulge in truancy, with all its temptations to escape from it, or adopt some wild behaviour to gain compensation in notoriety. Broken homes or warring parents fail to give children emotional security or discipline or even normal family interests and occupations, and the resulting vague disturbances of peace of mind may cause a child, untrammelled by control and ordinary ethical standards and with time heavy on his hands, to try to square things up by taking things from others, maybe his more favoured brethren, or even drive him to run away from the conditions that are disturbing to him. The number of cases where delinquency depends on specific mental illness is negligible, and then the trouble is usually obvious.

Psychiatric theory applied to delinquency can explain the deeper mechanisms which are operative in it, but it does not excuse the misdeeds nor help in the practical solution of the problem. Its application has, in fact, hindered progress by creating the erroneous belief that the whole matter is so deep and delicate that no direct methods to deal with it should even be tried. This has given free rein to those who hold that crime is a mental disorder, and inhibited the common sense in their efforts to do something about it. Juvenile delinquency will persist until it is recognized that children gain stability and security from work, control, and discipline, and that these can be applied as well as understanding and correction of the underlying causes of the inacceptable behaviour.—I am, etc.,

WILLIAM MOODIE.

London, W.1.

Homosexuality

SIR,—The letter of Mr. D. Stanley-Jones (Feb. 2, p. 179) reflects very adequately the views of medical men who have knowledge of patients afflicted with sexual inversion. It would, however, be rash to assume that all homosexuals are to be pitied. Many are untreatable by psychological methods because they disdain treatment or seek it only when faced by unwelcome social complications. Homosexuals of this type are proud of their condition and regard themselves as of superior quality to those whose sexual instincts are normally directed. The size of this group is unknown, as only a few from it seek medical advice. But, in addition, there are very many homosexuals who do realize their abnormal state, regret it, and long for release from it. Some of these can be cured, and others can be helped to make a satisfactory adjustment to life.

The estimate of 2% of the population made by Havelock Ellis is probably an intelligent guess: there are no figures on which such a calculation might be based. The number of homosexuals is high, and may well be more than 2% of the population.

From time to time these unfortunate people come into the hands of the police. The working of the legal machine is by no means uniform. The wisdom or discretion of judges and magistrates shows much variation. On occasions I have appeared as an expert witness when a homosexual had come for trial. My experience has been on the whole favourable, and I have been impressed by the broad-minded attitude of certain judges and magistrates who, on hearing medical evidence, have put the prisoner on probation. This, of course, has not always followed.

In many instances, presumably, no medical evidence is called. Within the last few months severe sentences have been passed on persons found guilty of homosexual practices. Mr. Stanley-Jones refers to one such case. Another example is the sentence recently passed upon an Edinburgh schoolmaster. The protection of the public is apparently a chief consideration in the mind of the judge who passes sentence. This is clearly important, but it can be over-emphasized. I have, from time to time, seen the "victims" of homosexual practices, and the psychological trauma from which the occupants of the Bench consider they must suffer has been absent. The incident had made little or no adverse impression on the youth, as an adjustment had been made to it. To protect a youth from such an experience is very important; but the normal boy will not be blighted for life if he is unfortunate enough to have been on terms of sexual intimacy with a homosexual man. There are other factors in such relationships; and the sexual activity may play a minor part in a friendship which often has in it much of value.

It is true that the medical profession is largely uninformed about sexual perversions. But ignorance is less widespread in the younger generation. In certain medical schools systematic lectures on the psychoneuroses are given in the clinical years, and teaching on sexual abnormalities is included in these. Much remains to be done. Such lectures should be in the curriculum of every medical school. Similar courses of lectures for general practitioners were given regularly in various centres in London before the war and are being resumed. Before we condemn

the obscurantism of the legal profession we must set our own house in order. Some judges are not swayed by medical opinion even when it is available. Their interpretation of the law is their only guide. It is time, therefore, to amend the law so that they may be freed from the compunction which may well arise in the administration of a code condemned by informed opinion.—I am, etc.,

London, W.1. E. A. BENNET.

SIR,—I was much interested in Mr. D. Stanley-Jones's most eloquent letter (Feb. 2, p. 179). Now that this subject has been opened in your columns I hope that it will be ventilated more fully by authorities better qualified than I.

I have no claim to write as a psychologist, but as a venereologist I am frequently called on to advise on various aspects of sex, including homosexuality or inversion. Many of my invert patients have been treated, some of them for prolonged periods, by medical psychologists with complete absence of success. From my own impressions and from what I have read, I think one must distinguish between genuine inversion, almost certainly a congenital condition, and those who have, as the result of certain circumstances, temporarily acquired the habit of homosexual practices. I believe that it is this latter type of case that may be benefited by psychotherapy. With inversion there appears to be an inborn unwillingness to be cured. In such a case I should imagine that it would be as difficult to achieve a reversal of the sexual aim as it would be in a heterosexual—i.e., normal—subject.

In the pathetic case mentioned by Mr. Stanley-Jones surely the man was being punished not so much for his homosexuality as for his lamentable absence of control. Offences against little girls, equally or even more common, are in a similar category. Distressing as it is, I cannot help feeling that psychological treatment would be quite hopeless in a man of his age and record. Society must protect its children to the best of its ability. I do not see any alternative in this particular case.

I feel sure that Mr. Stanley-Jones is in general mistaken about the "ignorance of sexual abnormalities" in the Prison Medical Service, and I think that if this unfortunate man shows any desire to co-operate, all that is possible in the way of psychological approach will be done.—I am, etc.,

London, N.W.8. F. G. MACDONALD.

SIR,—I would like to support the protest uttered by Mr. Stanley-Jones against the sentence of fourteen years' imprisonment recently meted out to a scoutmaster convicted of immoral conduct with boys. It is true that the law lags some fifty years behind public opinion and that the public has not yet realized that the homosexual is not himself responsible for his inversion, but the medical profession cannot be held entirely guiltless if, with more knowledge, it accepts the Law's method of dealing with such cases. Minors of both sexes must be protected against sexual assault, but the Law's "treatment" of homosexuality is an anachronism in an age which recognizes that it is sometimes amenable to suitable medical measures. Is it not giving the Law our approval when we remain silent?—I am, etc.,

London, W.1. KENNETH WALKER.

SIR,—In view of Mr. D. Stanley-Jones's letter I am writing to call attention to a resolution passed at the recent annual general meeting of the Prison Reform Council, in case it might be of interest to your readers:

"*Resolution 2*: This meeting records its opinion that the present arrangements for dealing with persons convicted of homosexual offences, sexual malpractices, and assaults and similar offences, are inadequate and deplorable, and asks that whilst the present practice of committal to prison is followed, the best possible psychological treatment should there be available, and calls for a change in the law whereby such offenders shall no longer be sent to prison but placed—where necessary—under more suitable restraint."

In dealing with such cases there appear to be two lines of approach: (1) preventive, (2) curative. Under the former heading the early environment must be studied, for there is much evidence that sexual malpractice (e.g., homosexuality) is mostly acquired and is the outward and visible sign of inward emotional disturbances generated by unfortunate early environments. Frequently the parents have wanted a girl rather than a boy, and as the boy grows up he is over-indulged—a tendency in parents towards an unwanted child. In addition, perhaps his hair is kept too long and his garments in early life are more feminine than masculine; habits of cleanliness are enforced too rigidly and too early, while that amount of roughness and independence so wholesome for the developing male is checked, and in its stead dependence is encouraged, with the development of "the mother's boy." Early protests to such handling become generated in the boy and repressed. The thinly disguised wish of the parents for a girl may result in the boy becoming a resentful caricature of one.

Another frequent cause of early difficulty is found in the child that is brought into too close proximity when young with adult sexuality. It is even found to be unwise to let children share the parents' bedroom, for precocious looking is stimulated. The wiser parent will arrange for his child, whether male or female, to have its own room—perhaps opening off that of the parents.

During the first six years of life it is wise for parents to abstain from manifestating undue interest in the child's anal activities. They should avoid stimulating the child's erotic zone, either directly or indirectly, for such stimulation may predispose the child towards imitation and repetition, with the perpetuation of unnatural practices. Therefore, unless it is absolutely necessary for the child's health, it is wise to avoid (*a*) rectal examination, (*b*) an enema, (*c*) a suppository. In other words, the adult should do nothing that could be construed by the child as a "rape," or breaking into his "house." Such treatment, however well meant, can only foster those suspicions of an adult and incite fear, for such suspicions reside in the mind of every child. Confidence in adults is acquired and never innate.

To overcome any such fear that may have been aroused, the child tends to become subsequently too passive. It may offer its own house or body to be broken into. The child may then grow up to become a soliciter—that is, if male the passive homosexual, and if female the prostitute. Alternatively, if such a man be of a more vindictive turn of mind, he may develop retaliatory habits and become the house-breaker or the raping adult who may even sexually assault children of the age that he was when he was (as he felt it) "assaulted."

Should prevention fail, the only efficacious treatment to my mind is psycho-analysis, but the individual must wish for this, and it is useless if carried out under duress. Such treatment has the advantage that the patient can carry on with his ordinary work, coupled with daily visits to his analyst. Opportunities are provided in the treatment for the liberation of those affects and emotions that have hitherto been pent up—such affects due to all those early interferences that have preceded the formation of his perversions. Only then is there a chance of such propensities becoming diminished and even ultimately disappearing. The earlier in age such treatment can be carried out the easier it will be. After being a short time under treatment the patient is more easily able to control his tendencies so that they are kept within bounds and at any rate no longer obtrude upon a disgusted public. Later on, as Mr. Stanley-Jones has stated, they may be able to be given up entirely, though naturally this must largely depend upon how strong is the wish in the patient to be cured, how early in life the provocative stimulus was aroused, and if the patient can continue his treatment for a sufficiently long period.

An interesting commentary on the Law's approach to such matters is provided by the fact that where it takes little or no notice—as in the case of female homosexuality—it tends not to obtrude itself unduly upon the notice of the public, whereas in the case of male homosexuality, about which matter the Law has tended to become over-zealous in its attempt to stamp out such practices, they flourish and indeed become more and more insistent. So far from showing signs of diminishing, it appears to be on the increase. It is only necessary to visit any public lavatory in this metropolis to observe how numerous such practices must be—what with the writings on the walls, holes bored in lavatory doors, etc. The very recent case of a scoutmaster sentenced to fourteen years for certain serious offences against four boys in his troop, referred to by Mr. Stanley-Jones, is a case in point. He had had two previous convictions, one in 1922 and another in 1932, and so far as one can gather he had had no psychological treatment for his obsession.

It must be remembered that anyway the homosexual is a rebel. The more you try to excommunicate a rebel the more of a rebel does he behave. The Law as at present constituted makes two cardinal errors at least, to my mind, in its handling of this matter: (1) It obliges the homosexual's (unspoken) request for a homosexual environment by sending him to prison, segregated from the opposite sex. (2) It obliges the homosexual's craving for notoriety (exhibitionism), first by the spying and watching needed for the police to take action; secondly, by the committal, prosecution, and trial that must follow. Homosexuality is kept alive by such treatment. The prisoner is discharged after a long or short sentence, remaining still the homosexual but now one with a grievance, and so the blackmailing type may result.

Unnatural offences are not to be satisfactorily dealt with by the attempted forcible restraint of the offender in a strictly unnatural (i.e., homosexual) and artificial environment such as prison provides. Even were psychological treatment to be provided for such a one (which it is not), it is doubtful whether such an environment would not work against a successful outcome. Success in psychotherapy depends so much on the voluntary nature of the treatment; it cannot be carried out under duress. The public naturally must be protected, but prison seems hardly the ideal way to achieve this.—I am, etc.,

London, W.1. A. CYRIL WILSON.

SIR,—May I, as a psychiatrist and a practising psychotherapist, add my own profoundly indignant protest to that of Mr. Stanley-Jones against the sentence of fourteen years' penal servitude passed on a scoutmaster recently.

It should be possible—and I shall be the first to join forces—to make psychiatry's weight felt against the passing of such judgments. I possess records of other such cases, none, however, so ghastly in their severity as this one, and I shall welcome any further data any of your readers may care to send me on the subject.

I should also be grateful to receive the co-operation of other psychiatrists, preferably those who, like myself, are uncompromisingly heterosexual, in order that concerted action may be taken towards a modification of existing laws.—I am, etc.,

Ashwood House, Kingswinford, Staffs. WM. A. O'CONNOR.

SIR,—Mr. D. Stanley-Jones's letter (Feb. 2, p. 179) must have been a shock to those readers who complacently assumed that law and medicine advanced side by side in these enlightened times, and learned judges eagerly sought the advice of psychiatrists in appropriate cases. The sentence of fourteen years' penal servitude for homosexuality takes one back to the days when people of unsound mind were put in chains. Is there no medico-legal organization to protect psychopathological cases such as this from out-of-date laws and direct the sufferer to the proper channels of treatment?

When the husband of one of my patients was summoned for indecent exposure I made strong representations to the defending solicitor, who was able to persuade the stipendiary magistrate to await the examination of the patient (accused) by an eminent local psychiatrist. As a result of the latter's findings the man was bound over on condition he attended the specialist for treatment. This he did until a cure was effected.—I am, etc.,

Hull. L. I. HARDY.

"Cord Round the Neck"

SIR,—The stupendous total of 5,000 confinements attended by Dr. Robert Anderson (Feb. 9, p. 219) with no stillbirths which he could ascribe to the common obstetric finding of cord round the neck seems most remarkable, and should, no doubt, scotch the "obstetric superstition" (Mr. Mortimer Reddington, Jan. 19, p. 109) under which we have, shall I say, sheltered for so many years.

In the past twenty-four years I suppose I have attended a mere 500 cases, if as many, and I seem to remember not a few in which the cause of the stillbirth appeared to be "cord round the neck." Two cases come to my mind.

The first was a lady in her thirty-eighth week, who, in the absence of disease or trauma, had a sudden concealed haemorrhage. Delivery took place a few days later. The stillborn child had a very tight short cord wound round its neck, and the placenta showed a central area which obviously had been dragged away from the uterine wall by the short cord some days previously. I take it that the descent of the head into the pelvis gave the final tug that pulled the centre of the placenta away from its site.

The second case had a happier ending. A middle-aged lady, who had lost her first baby in childbirth and who was desperately anxious not to lose her second, was found to be a breech. This I turned by external version on more than one occasion, but back the baby turned almost immediately. There seemed to be an elastic "something" that pulled the head out of its proper position. I made the provisional diagnosis of a short cord wound round the neck, and sent the case to Prof. English in Singapore, asking for a "Caesar" to be done to ensure a live birth. This he did, and confirmed the diagnosis at operation, and produced a live child. Had this case been allowed to go into labour as a vertex I am certain that the child would have been stillborn and the cause again would have been "cord round the neck."

I should like, however, to read further opinions from men better qualified than I to express them, and I hope they will find time to give us the benefit of their views.—I am, etc.,

Edinburgh. I. G. CAMERON.

Predisposing Factors in Carcinoma of the Cervix Uteri

SIR,—I think that your correspondent Dr. Nettleton (Feb. 2, p. 182) must have misunderstood Mr. Carnac Rivett. It is well known that carcinoma of the cervix does occur in nulliparous women. The late Dr. Horden stated in her book that of the cases admitted to the Marie Curie Hospital 134—i.e., 10.4%—were in nulliparous women. G. Ward gives the figure of 12%; the figure at Mount Vernon Hospital is 8%. Your correspondent will find some interesting observations by Dr. Percy Stocks on this subject in the British Empire Cancer Campaign Annual Report for 1941. Of 800 cases of cancer of the cervix, 11.3% occurred in nulliparous women. Those figures were obtained from the statistical survey carried out by the Clinical Cancer Research Committee.

Personally I consider that the trauma due to confinements is very unlikely to be a major factor in the aetiology of this disease.—I am, etc.,

London, W.1. MALCOLM DONALDSON.

Self-medication in Midwifery

SIR,—All the methods for the relief of pain in labour which have appeared recently in this *Journal* depend for their success on the presence of doctor or nurse. For several years it has been my routine practice to leave with the patient at the antenatal examination four capsules of nembutal gr. 1½ (97 mg.). The patient is instructed to take all the capsules as soon as the pains occur at ten-minute intervals. There has never been the slightest sign of overdosage in mother or child. In fact it is usually necessary to supplement the nembutal with some other medication, for which my personal preference is hyoscine. Probably this method is widely used already. It has the great advantage of reassuring the patient, who knows she is not entirely dependent on outside sources for the relief of pain.—I am, etc.,

Norfolk. J. N. GALE.

Tuberculosis in Childhood

SIR,—The controversy which has arisen on this subject (Feb. 2, p. 180) is unfortunate. Surely the tragedies of juvenile tuberculosis should not be the battleground of two diametrically opposed opinions. Whatever the real incidence of infection with the tubercle bacillus in infancy and childhood may be, the fact remains that in regard to the individual case no one can say with any certainty what will ensue. We know something of the life history of the infection, and we know that Nature is, in many cases, kind and curative, but it would be most unfortunate if the profession and the public should gain the impression that tuberculous infection in children is of no real significance. Even if there have been "for a number of years fewer than 2,000 cases of tuberculous meningitis," this cannot, in the minds of physicians, be regarded without concern. It would perhaps be much more pertinent to try to inquire more precisely why some cases generalize and produce this fatal outcome rather than accept it fatalistically. Also, do we know how many babies and young children die with unsuspected tuberculous bronchopneumonia or miliary tuberculosis? Why should some of us strive to ensure a tubercle-free milk supply

if, on the other hand, we say that the more common aerogenous infection does not really matter? I am sure paediatricians do not wish to overweight the importance of this, but they cannot close their eyes to something which can be bettered. Surely the answer is not complacently to suggest that "such children appear to be like guinea-pigs in whom the disease follows an inevitable course," but to pool effort, resources, and interest, in expounding by gentle persuasive tactics, without undue alarm, the preventive principles so admirably stressed in Prof. Moncrieff's lecture.

Statistics may give a sense of relief, but to the consulting physician and family physician they may not operate so convincingly. One must grant the deepest sympathy to the phthisiologists in their overwhelming tasks, but a good winning team calls for a stubborn defensive line as well as lively thrustful forwards.—I am, etc.,

Birmingham. A. V. NEALE.

SIR,—My plea was for the routine tuberculin testing of children and for the separation of the positive reactors under the age of 2 years from cases of open tuberculosis.

We are all agreed that primary tuberculosis in *childhood* is usually benign, but unfortunately in *infancy* such is not the case. Routine testing of infants would surely bring to light many unsuspected cases of adult phthisis in home contacts, and it would also help materially to diminish the number of deaths from tuberculous meningitis.

Dr. Hall is wrong in assuming that I advocate spending time, energy, and money on cases showing only a positive Mantoux; I do no such thing. He is also wrong in saying that first infection is almost always innocuous. In infancy it is fraught with grave danger, and the sooner this is generally appreciated the better.

Dr. Orpwood asks how it is that individual paediatricians see scores of infants dying from tuberculous meningitis. It is, alas, because there are such scores of infants who die from it (nearly a hundred score every year, according to his figures). In the last twenty years I myself have certainly seen scores, and I make no claim to any special experience of this condition not shared by other paediatricians.—I am, etc.,

Warwick. WILFRID F. GAISFORD.

Effect of Blast on the Human Ear

SIR,—I have read with interest the article by Major F. B. Korkis on the effects of blast on the human ear (Feb. 9, p. 198). My experience in Italy has been much the same as his. In 1944, out of 3,296 new cases examined 344 (10.4%) were patients suffering from the effects of blast. Of these, 101 had a concussion deafness with normal drums; 50 showed drum congestion and haemorrhage; 115 revealed traumatic perforation, unilateral or bilateral; and the remaining 78 suffered from traumatic otitis media. All were treated to recovery, and only seven cases required mastoidectomy.

Major Korkis was indeed fortunate in having a full set of tuning forks and an audiometer with which to test his patients. The British otologist, unless he carried his own instruments, was provided with only two forks, 256 and 512 d.v.s. Indeed, it was only after the collapse in North Africa that I was issued with a 4,096 d.v.s. fork and thus was able, with some accuracy, to test for concussion deafness. A patient who has been in action and who, with a positive Rinne, cannot hear a 4,096 tuning fork is suffering from concussion deafness.

Two of the conclusions reached by Major Korkis are of more idealistic than practical value. I do not think it possible to review every six months the ears of those exposed to blast. I was attached for over two years to the hospital which served the Royal Artillery Training Depot and can assure Major Korkis that the population of the depot was constantly changing and was always numbered in the thousands. To have attempted such an investigation would have been impossible. Furthermore, on British classification of medical categories it was not possible to ensure that a man would be kept off the guns. One could not qualify a medical category in the C.M.F., and could only make recommendations to the medical officer of his unit. Records Office, who did the postings, relied solely on the actual category. Nor, from the man-power situation, could one in all honesty make the men C1 (base duties only), as no replacements were possible and the men were physically fit and anxious to return to their old units.

The other conclusion of Major Korkis with which I cannot agree is the suggestion that all men under the age of 40 should have a routine audiometry. This is impossible on two scores. In the first place, there are no Army audiometers in this country. Secondly, the Government is at present releasing 100,000 Service personnel weekly. Who is to undertake this routine audiometry? There are thirteen British Army otologists in the U.K. at present, so each would have to do nearly 8,000 audiograms every week. Or does Major Korkis intend the civilian otologists to help? In that case, on the assumption that there are 300 otologists in the country, each would have to carry out over 300 routine investigations in addition to his normal week's work.—I am, etc.,

London, S.W.1. J. F. BIRRELL,
Lt.-Col., R.A.M.C.;
Adviser in Otology to U.K.

Stethoscope versus X Rays

SIR,—As one who has interpreted between 20,000 and 30,000 chest skiagrams, mainly of patients previously examined by myself clinically, I should be the last to dispute the undoubted fact that in the vast majority of instances *x* rays give a more accurate picture of the localization and probable nature of any lesion present than do the clinical findings. However, there are cases where abnormal clinical signs can be found prior to the appearance of any shadow on the film, and the abandonment of the use of the four senses in favour of one only would in these cases be disastrous for the patients concerned and damaging to the reputation of our profession.

I am sure that most clinicians with extensive experience in the diagnosis of chest disease must have come across the patient who is referred for an opinion because of toxic symptoms, evening temperature, lassitude, weight loss, and occasional dry cough, where, on clinical examination, the findings are increased muscle tone over one upper zone with resulting diminution in movement and weakening of the respiratory murmur, and where the film, taken with an efficient and up-to-date *x*-ray apparatus, fails to reveal any abnormal shadow. If one's clinical acumen brings about a realization that the patient is ill he is kept under observation, when a further film in a few weeks' time will reveal an early tuberculous lesion at the site of the abnormal signs. If not, and the patient is regarded as non-tuberculous, he returns sooner or later with his disease in a more or less advanced stage. Such cases are admittedly rare, but I can myself remember at least half a dozen in the course of fifteen years' work. The only explanation I can offer for the failure of the *x*-ray to demonstrate the condition is that the disease is so early that sufficient exudate has not developed to create a demonstrable shadow. This explanation is supported by the fact that cases of generalized miliary disease frequently fail to show any lung abnormality on *x*-ray examination in the early stages of the illness.

More important even than early tuberculosis and much more frequently missed on *x*-ray examination is the early neoplasm, before the tumour has passed beyond the confines of the bronchus or brought about sufficient occlusion of it to produce a degree of collapse which can be noted on a skiagram. The patient is usually referred because of one or more of the symptoms—dyspnoea, pain, and haemoptysis; and physical signs in the way of slight localized impairment of movement and diminution and alteration in the tone of the breath sounds with prolongation of expiration should dictate bronchoscopy, despite negative *x*-ray findings. More than one operable tumour has been brought to light in my experience where physical signs alone gave any indication of its presence.

In chest examination, therefore, we must still continue to use all our senses, except that of taste, and the employment of all projections of them which can help us, be they *x* rays, stethoscopes, or bronchoscopes, must continue to be taught and well taught. Here I would put in a plea for using the early case for teaching purposes, so that the finer shades in physical signs may come to be learned as well as the gross manifestations of well-established disease conditions.—I am, etc.,

Leicester. A. SCOTT,
Tuberculosis Medical Officer.

SIR,—Surely Dr. F. Kellermann (Feb. 2, p. 182) misses the real point. The caption "Stethoscope *versus* X rays" is a misleading one. It should be "X rays *versus* Stethoscope." I think it can be confidently stated that there is not a single "defender of the stethoscope" who does not believe in the high value of *x* rays in the diagnosis of pulmonary disease. But the reverse does not apparently hold true—i.e., there *are* "enthusiastic defenders" of *x*-ray diagnosis who *do not believe in the value of auscultation.* Otherwise what is one to infer from such statements as those made at the recent debate of the Royal Society of Medicine? The "defenders of the stethoscope" claim no more than that *x*-ray examination should not be regarded as a complete substitute for the well-tried clinical methods of examination—which include, of course, a good deal besides auscultation. Surely the right view is that *x* rays should be only one link (and a highly important one) in the chain of evidence sought for in arriving at a diagnosis of chest disease. *X*-ray examination is not infallible; witness the letter immediately following that of Dr. Kellermann, from Dr. Frankland West, which could be corroborated by many similar cases; and infallibility absolute is not even claimed by those who, notwithstanding, condemn the stethoscope as obsolete. Moreover, clinical evidence will often give more information as to activity or non-activity of pulmonary disease than is to be got from *x*-ray examination alone. The importance of this controversy lies partly in the fact that some of the statements made at the Royal Society of Medicine debate came from members of the teaching staffs of one or other of our own great London hospitals and might therefore be accepted as authoritative by junior members of the profession.—I am, etc.,

Southborough, Tunbridge Wells. E. WEATHERHEAD.

Familial Methaemoglobinaemia

SIR,—Two cases of this condition were reported by Deeny, Murdock, and Rogan (*Journal*, June 12, 1943, p. 721).

A female infant aged 8½ months was seen on March 2, 1944. Dr. M. L. Poston, of Urmston, reported that she showed extreme cyanosis early in the morning, and especially in cold weather. She was commonly very blue and cold in the morning, and the cyanosis was worse when she had been out in the pram for five or ten minutes. The skin surfaces were "stone cold," and the cheeks were exceptionally tinged with blue. The blueness was not more noticeable when the baby cried. The mother's grandfather had a tendency to the fingers "going dead"; her brother had "blue hands" in his teens; and the mother herself had a slight bluish tinge in her cheeks, but did not look unhealthy.

On examination there was no cardiac bruit, but an *x*-ray showed that there was a little enlargement to the right side. These findings suggested a diagnosis of congenital familial methaemoglobinaemia, and the child was given vitamin C, 50 mg. daily.

In April, 1944, Dr. Poston wrote that the baby had reacted very well to the treatment, the blueness having disappeared. In Dec., 1945, the cyanosis recurred in a milder form but was abolished by the same treatment. The patient has since left the district and passed from observation.—I am, etc.,

Manchester. C. PAGET LAPAGE.

Jittery Legs

SIR,—I was very interested in the annotation entitled "Jittery Legs" (Jan. 19, p. 95). I myself have come across several cases of this complaint, under a diversity of titles from "fidgety feet" or "pains in the feet" in the South, to "happy feet" on Tyneside. Possibly the reason for the sparsity of literature on the subject is that the symptoms are often attributed to a neurosis, in spite of the fact that the patients concerned are usually not of the "neurotic type."

The patients complain of jittery legs, but if questioned nearly always admit that the "fidgets" begin in the *feet*; in some people, indeed, the trouble never extends beyond the feet. The patients are, I have noticed, almost always subject to chilblains, and their feet are usually cold when examined in the surgery; however, the "fidgets" come on only when the feet are warmed. Hence they will avoid a hot-water bottle, or will deliberately sleep with their feet out of bed. Further, they have noticed that if they raise the foot of the bed the symptoms are alleviated (for, since the condition is so distressing, there is nothing they will not attempt, by "trial and error," in an effort to alleviate their symptoms). Finally, walking about, or rubbing the feet, will relieve them. Every patient suffering from this complaint whom I have questioned admits that the onset and severity of the symptoms are proportional to their degree of tiredness.

Do not the above observations—the syndrome occurring in patients suffering from chilblains and habitually cold extremities brought on by tiredness and warming of the feet, and alleviated by exercise, massage, and raising of the limbs—indicate that the disorder is primarily circulatory in origin, the poor venous return causing metabolites to accumulate in the periphery, due to pooling of the blood in the dilated capillaries?—I am, etc.,

Newcastle-upon-Tyne General Hospital. AUDREY ROBERTS.

SIR,—Your annotation (Jan. 19, p. 95) on Ekbom's syndrome of fidgets in the legs will help to fill a gap in neurological literature. I am well acquainted with one typical case—that of a professional man who from the age of about 16 suffered from these sensations. He was forced to move his legs for relief. The sensations or fidgets were sometimes accompanied by wave-like tightening up of the muscles of thigh and calf. They occurred chiefly at night, when they wakened the patient from deep sleep. In earlier life, up to about 45, the trouble was not serious and only involved walking about the bedroom for five to ten minutes. After this age, however, it got much worse, the fidgets coming on just as he was dropping off to sleep and continuing for the greater part of the night. Sleep was broken, the patient being forced to perambulate his room for hours at a stretch. The only remedies which gave relief were tea, coffee, and hot baths. Sedatives, such as bromide, chloral, or barbiturates, aggravated the condition, while psychological discussions did no good. The only constant physical sign was a rather low blood pressure. Finally he had to give up his employment owing to lack of sleep. At this point he was advised to stop smoking as an experiment, although he was not a heavy smoker (about twelve cigarettes a day). Reduction of his daily allowance to three cigarettes was followed by great improvement, while backslidings caused return of the symptoms. He now smokes not more than one cigarette a day, and is able to resume work and lead a normal life, sleeping soundly on most nights and only occasionally suffering from fidgets.

May I, pedantically, deprecate the word "jitters."—I am, etc.,

"F.S., M.D."

SIR,—The sensible letter from a doctor's wife (Feb. 2, p. 183) induces two comments, the latter somewhat overdue. Though the step may appear entirely to lack either clinical or pathological backing, a trial of vigorous anti-anaemia therapy will sometimes clear up an obscure and distressing symptom in a woman; fresh in my mind where this happy result accrued was one of loss of taste in a youngish married woman.

The subject of chilblains afforded "Doctor's Wife" an opening for a sly but well-merited dig at her husband's profession. In "Any Questions?" a few months ago (Nov. 3, 1945, p. 633) your expert told us that there were no scientific grounds for the giving of nicotinic acid in this common and misery-making complaint. Be that as it may, my experience has convinced me of its practical value in some long-standing cases which had previously failed to respond to more classical remedies.—I am, etc.,

London, W.13. FRANK CROSBIE.

The Metric System

SIR,—To your efforts regarding the introduction of the metric system into your *Journal* may I add the following, as I feel I can speak with some authority, having been trained in both the apothecaries' and the metric systems. By inserting metric equivalents parenthetically after each old-style dose, weight, and measure this is carried out sufficiently so far as it is intended to enable the medical man abroad to read the *Journal* in terms of the system familiar to him. I strongly feel, however, that this practice will fail in making the metric system a popular one with the British practitioner.

In giving absolute equivalents you introduce unfamiliar dosages in the metric system. These dosages are not in com-

mon usage and would not be easy to memorize. For example, nobody prescribes 16 mg. morphine (1/4 gr.) on the Continent, but either 0.01 g. or 0.02 g. (or, if you like, 10 and 20 mg.). Again, in your issue of Jan. 12 (p. 74) you give the prescription of an alkaline draught: sod. chlor. and sod. bicarb. āā gr. 15 (1 g.) in 2 oz. (56 c.cm.) of warm water (because the British practitioner is used in prescribing in table- and tea-spoonful doses). It must be hard to memorize just 56 c.cm. The usual way in the metric system is to prescribe amounts of, say, 250 or 300 c.cm. and not 224 or 336 c.cm. (8 oz. or 12 oz.), etc. The man educated in the metric system either prescribes—in the case of powders—a single dose and remarks: T.D. No. X (so many doses, send ten) or—in the case of liquids—he multiplies the single dose, e.g., with 25 and prescribes: sod. chlor. and sod. bicarb. āā 25 g., aquam ad 600 c.cm.; signa: 4 tablespoons t.d.s.; or he will probably prescribe sod. chlor. and sod. bicarb. āā 25 g. aquam ad 300 c.cm.; signa: 2 tablespoons t.d.s. in water. I am aware that 24 tablespoons are not exactly 300 c.cm., but 1 oz. is not exactly 28 c.cm. and also 1/4 gr. is not exactly 16 mg. Unless the familiar or usual prescription in the metric system is put parenthetically to the apothecaries' one, the metric system cannot be made popular with the British practitioner or student.

Further, I would suggest that the term ml., which is not in general usage on the Continent, should be dropped, and c.cm. used exclusively instead. This must of necessity confuse the medical man abroad, which fact does not help to achieve the goal originally aimed for.—I am, etc.,

Cambridge. ALBERT W. BAUER.

The G.P. and Hospital Practice

SIR,—Many hospitals are now being released from military service and restored to civilian use. Now is the time when, in their reorganization, far-seeing hospital authorities could ensure that co-operation of practitioners with hospitals about which we read so much and so far have little opportunity of seeing put into effect. It is a fact at the moment that the general practitioner is completely excluded from the wards in most of these hospitals; and while I appreciate the difficulties that might arise in administration, with 20 doctors responsible for their own beds, I think this could be overcome in the same way that it was overcome in America by the Permanente Foundation in San Francisco (Garfield, S., *J. Amer. med. Ass.*, Oct. 7, 1944, p. 337).

My suggestion is that the consultants of these hospitals should invite local practitioners to do a ward round with them once or twice a week. Thus the practitioner would have the opportunity of maintaining contact with both his patient and with the latest medical teaching. The consultant would still be in charge, from the point of view of administration, and I would also suggest, with respect, might learn a little, too, from his colleagues. The complete divorce which now exists between patient and general practitioner when once the former enters hospital can thus be overcome with mutual benefit. I would recommend hospital authorities not only to study this question but to bring about a speedy solution in actual practice.—I am, etc.,

Urmston, Lancs. BERNARD SANDLER.

Diagnostic Acumen of the G.P.

SIR,—Is it not possible to alter the tone of this discussion, which, if memory serves, began with diagnosis of cancer of the breast? Should early cancer be referred to, the problem is admittedly not easy; indeed, it is frequently solved by a biopsy or, alternatively, the removal of a non-cancerous breast by the distinguished specialist.

The errors of the G.P. have been pilloried, and it would be easy to produce a list of mistakes by very eminent surgeons and gynaecologists. I could supply a few, even, on occasion, made against the advice of the attending practitioner. *Cui bono?* Surely the moral is that we all approach our work with some sense of responsibility and proportion, and that we remember that consultation with, not merely listening to the *obiter dicta* of, trained and skilled specialists will often be in the best interests of all.

May I suggest to Mr. Deitch (Feb. 2, p. 183) that failure to give weight to rising blood pressure and oedema does not in these days argue a very competent practitioner, even if one reads in Munro Kerr's recent *Obstetrics and Gynaecology* on toxaemia: "Even to-day the subject is teeming with opinions and theories."

The day may come when everyone will be referred to the appropriate specialist by a sorting clerk, who could in no sense of the term be called a general practitioner. Till then should we not realize that there is no closed monopoly of intelligence and that mutual recrimination or one-sided slanging does not make for the dignity of our profession or the advance of our art?—I am, etc.,

Southport. W. A. MACKAY.

SIR,—Every G.P. of reasonable competence has a right to fulminate against ill-considered and libellous indictments such as the misstatement that "the general practitioner . . . is a careless and poorly equipped accoucheur, a positive danger to any lying-in woman, and should on no account attend a midwifery case" (Jan. 12, Feb. 2, etc.). This may apply to *some* G.P.s, but certainly not to general practitioners as a whole.

What G.P. of tolerance born of experience would make the counter-charge that no lying-in woman should ever be attended in an institution because cases are on record where sepsis has been spread round a ward to other lying-in women from an infected case? Or because mothers have been sent home from nursing homes with breast abscess, or sent home with the wrong baby owing to errors in labelling newborn infants in mass-production centres?

Mr. H. I. Deitch (Feb. 2, p. 183) quotes the occasional tragedy seen in hospitals. He appears to forget from his calm sequestered heights that the hospital obstetrician sees more of abnormal than of the normal confinements ably performed throughout the length and breadth of the realm, including rural areas and the Outer Hebrides, and suggests that it is stubborn not to realize that obstetrics is a special art to be performed only by those with special knowledge and experience. Are obstetric specialists born experienced? He quotes a case where forceps were applied outside the os—a heinous offence, all will agree. May one ask who taught the offender, examined him, and passed him fit to practise on a trusting public?—Obstetric specialists of repute. Are we justified in stating, therefore, that no obstetrician should be allowed to teach or examine in obstetrics? We should be no more justified than are the few obstetricians who cite the errors of "black sheep."

Suppose that we took the cranks at their word. Are there enough obstetric beds to accommodate all normal as well as abnormal confinements? No! Would the great men attend the normal cases themselves, or would the labour-ward sisters do the work and act as G.P.s, calling for assistance if a case presumed normal on examination proved difficult in labour? Why should expectant mothers who are physically normal be turned into physiologically and psychologically abnormal cases through fear engendered by the views of unbalanced obstetrical extremists? With Mr. Bevan making a frontal attack on the whole medical edifice it seems sad that some of the exalted chimney-pots should revile the foundation-stones of the obstetrical wing and tell them that they are a positive danger.—I am, etc.,

Norfolk. E. PUDDY.

SIR,—From their lofty heights our specialists and consultants are rather too fond of castigating the inefficient G.P., and demanding that this and that branch of medical work shall be taken from him, because of his gross errors. Do they never reflect that they only see the occasional mistake, and that the mass of good work done passes by them unnoticed? And do they *never* say, "There, but for the grace of God, go I"? Some years ago a very eminent paediatrician saw a patient of mine and diagnosed "suppressed whooping-cough." The child eventually turned out to have an abscess in the hip-joint. More recently I sent a woman to hospital to have a colporrhaphy, and she was returned to me with her appendix neatly removed. The fact is that all doctors are human and we all make mistakes. Let us try to correct our mistakes by all means, but let us sling a little less mutual mud in the process.—I am, etc.,

Ashtead, Surrey. W. EDWARDS.

Motive in Medical Demobilization

SIR,—Sir Ernest Graham-Little's letter (Feb. 2, p. 23), in which he suggests that the motive for the recent large demobilization of doctors is the desire of the Government to flood the medical market and to force us into a State service will be deeply resented by many of those who are lucky enough to be demobilized under this scheme. A less biased opinion might have come to the more obvious conclusion that, if the Government had this ulterior motive in view, it would have been to its advantage to hold up such a large demobilization until the summer, when it would have been extremely difficult to absorb so many men into medical activities. But just the reverse seems to have happened, for it is well known that for some months the Government has been pressing for the speedier release of medical men. This was no sudden decision, as Sir Ernest suggests, and if transport and other Service difficulties could have been overcome the present mass demobilization would have taken place earlier in the winter. However, better late than never; most of us will find plenty of work awaiting us, and we shall leave it to Sir Ernest to grumble that whatever the Government does is wrong.

The needs of civilian medicine have been stressed often enough in recent months. Surely it is more reasonable to assume that the Government decision was made in the interests of civilian patients and overworked civilian doctors than to consider it a piece of political chicanery. Why look for a dirty motive when there is an honest one staring you in the face?—I am, etc.,

Eastbourne. H. G. ESTCOURT.

A Fundamental Principle

SIR,—The letters in the *Journal* of Feb. 2 (p. 185), under the heading "A Fundamental Principle," were they to be widely circulated in the daily press, could only convince the State or community (I use the terms in the sense Dr. Eastwood understands them) that the medical profession is, in so far as the writers of these letters are representative of it, entirely selfish and unconcerned for the welfare of humanity as a whole. It is unfortunately only too obvious that so long as there is a shortage of doctors there will be a tendency—natural, I admit, however deplorable—for the poorer, dirtier, and therefore more needy areas to suffer from lack of adequate medical care. This tendency is inevitable, human nature being what it is, and the situation can be met only by a planned medical service, whereby an adequate number of doctors are directed to the needy areas. Had the profession as a whole in its discussion of the State medical service question showed some real concern for the welfare of the people, as opposed to that of the doctors, one might have hoped for a natural or spontaneous cure of this great medico-social malady. It is our own fault that the Government is about to take the cure out of our hands, and we cannot blame it.

I should be the last to suggest that direction should be unlimited, but surely direction of young doctors, say, under 30, with some temporary discomfort and loss of freedom, is a small sacrifice to pay, albeit a vicarious one, for the betterment of the health of our large industrial communities. Dr. Eastwood suggests that the State or community is about to exploit us for their own benefit just as "slaves are exploited." Surely this "noble" profession of ours, with all its culture, learning, and wide experience of life, could never become "enslaved" merely because its work was ordered or its members directed.

I venture to suggest that in accepting a full-time salaried State medical service, even though it may bring some restrictions on our professional or personal liberty, we shall be emancipated rather than enslaved. In the past many of us have been literally in bondage, with our practices mortgaged and with day-in-day-out competition, often against unscrupulous "colleagues" whose financial position is more satisfactory than their medical ethics or their knowledge of medicine. I would submit that for the young doctor direction for a year or two to an "undesirable" industrial area would prove much less soul-destroying than the present, often unfair, competition that is inevitable under the profit-motive system.

I feel it only right to say that I left the B.M.A. two years ago because I felt that its policy was entirely wrong. I still hope there may be enough leaven in it to "leaven the whole lump," and I trust you will show impartiality by publishing this letter in the *Journal*.—I am, etc.,

Glasgow. JOHN H. WILSON.

Principles IV and V

SIR,—I cannot believe that those who drafted the seven principles intend Principles IV and V to be taken seriously. If Principle V is read first and then IV they are as follows:

"V. Every registered medical practitioner should be entitled as a right to participate in the public service.

"IV. Doctors should, like other workers, be free to choose the form, place, and type of work they prefer without Governmental or other direction."

This would seem to mean that every doctor would have the right to demand an appointment in the public service in whatever type of work he preferred and in any place he chose. Should all the doctors in Sheffield wish, for example, to work in Bournemouth—a not unreasonable desire from some points of view—the Minister of Health would be bound to assist them to that end if Principles IV and V are to be observed.—I am, etc.,

Sheffield. JOHN PEMBERTON.

Medical Future of the Colonies

SIR,—Many of those who have served in tropical Africa are in full sympathy with the desire of Colonials to take an increasing share in the public services of those Colonies. But when your correspondents ("A Colonial," Jan. 26, p. 147, and Dr. Easmon, Feb. 9, p. 219) claim equal conditions of employment for Colonials and Europeans they ignore important issues.

The salary scales, leave provisions, etc., for Europeans have been drawn up with due regard to the fact that these officers serve in a climate highly inimical to them and far distant from their homes. Their emoluments may properly be considered as composed of a basic rate, augmented to compensate for these disabilities. In the case of the British Army, officers' pay is, I believe, doubled while serving in West Africa. Colonials can scarcely expect to be compensated for disabilities from which, in fact, they do not suffer.

And, looking forward to the day when these Colonies will manage their own affairs, a grave disservice would be done them by leaving a legacy of officials remunerated on a scale having no relationship to the economic status of the community, for whose benefit—in democratic countries at least—they exist.—I am, etc.,

Bournemouth. J. B. DAVEY.

The Disabled Person

SIR,—Dr. J. S. Laurie (Feb. 2, p. 183) refers to difficulties in the issue of certificates under the Disabled Persons (Employment) Act, 1944. While, as he says, every case must be treated on its merits, there are certain points which make it quite easy to decide whether a certificate should be granted in any particular instance.

First, there is the statutory definition of disabled person: "The expression 'disabled person' means a person who, on account of injury, disease, or congenital deformity, is substantially handicapped in obtaining or keeping employment, or in undertaking work on his own account, of a kind which apart from that injury, disease, or deformity would be suited to his age, experience, and qualifications; and the expression 'disablement' in relation to any person shall be construed accordingly. The expression 'disease' shall be construed as including a physical or mental condition arising from imperfect development of any organ." The meaning of "substantially handicapped" is made quite clear by the Minister. "The criterion for any applicant is the effect of the disability on his prospects of employment in comparison with those of a person of similar age, experience, and qualifications who is not so disabled and who is employed in or is an applicant for the same or a similar kind of employment." The Minister has also stated that in border-line cases a reasonable and generous view should be taken.—I am, etc.,

Hove. L. A. PARRY.

The Minister Listens

SIR,—Like countless others I have been waiting for many weeks for some hint as to how the negotiations were proceeding between the Minister and the Negotiating Committee. The answer comes in your leading article (Feb. 16, p. 240) and is that there have been none. The Minister listens but will not discuss. The information is illuminating if expected. Dr. Dain and his colleagues must realize that they are dealing with a Minister who will stop at nothing to get his scheme through and in working order so that his name will be immortalized by people "going on Bevan" instead of "going on Lloyd George." Why must the Negotiating Committee always behave like the gentlemen they are instead of fighting the Minister with his own weapons? Why must they allow themselves to be gagged until the Bill is before Parliament? It is quite time that the general profession were given a strong lead and advised that in each area arrangements must be made forthwith to carry on practice *under our own control* in the event of an unacceptable Act of Parliament being thrust upon us.—I am, etc.,

Middlesbrough. G. H. LOWE.

SIR,—Did the final paragraph in your excellent leading article entitled "The Minister Listens" convey a hint that in certain circumstances the medical profession might be advised to refuse service under the proposed new scheme of national health? If so, many of us who have abandoned hope may take heart again.

Unity in discussion and negotiation will apparently avail little or nothing, but in the last resort unity of action can prevail. A great and generous profession naturally shrinks from the idea of a "strike" which might imperil the health and lives of its fellow-men; equally so an educated and law-abiding profession would not presume to thwart or obstruct a lawfully elected Government. But to refuse a service which the profession with its special knowledge of humanity believes to be injurious alike to its own intellectual freedom and the public it serves would be neither illegal nor unconstitutional. Once the dotted line has been signed upon, however, further resistance will be illegal and useless. This is the last and only chance. Let us prepare for action before it is too late. Cultivated, free, and independent intellects must not be shackled in this land which has endured so much for freedom.

It is a sad sign of the times that even at this stage the writer prefers to sign

"NOT WITHOUT HOPE."

A Burning Topic

SIR,—It is not to be supposed that Dr. W. J. Gardner (Feb. 9, p. 220) intended his letter to be taken literally, any more, perhaps, than the correspondents he denounced did; but he is mistaken in his sweeping assertion that printing their letters can only cause irritation among your readers.

He is guilty, too, of a familiar form of false logic extensively used by correspondents in the lay press of demanding (in general terms) that A should be abolished in order to make room for B, when he has only a personal preference to offer as an argument, and A and B are not mutually exclusive. By all means let Dr. Gardner ventilate his complaint; but why must it be at the expense of harmless fellow-correspondents? A request for fair play should not itself reveal prejudice, and a letter demanding toleration should itself be tolerant. I do not seek to underestimate the difficulties of medical practice to-day; but I do not consider any reader of the *Journal* can consider himself starved of exhortation, controversy, or complaint. Is there to be no lighter touch, no relief, no diastole?

Five years or so of university life should make not only a doctor but also an educated man—perhaps even a cultured man. This aspect of the doctor's training is not easy to cultivate under present-day conditions; perhaps many of us have unduly neglected our small beginnings in this field; perhaps this generation, willy-nilly, cannot hope to attain the standards of culture and scholarship which graced the lives of many of our teachers and predecessors; but this does not justify brushing aside the work of others—unnecessarily and irrelevantly—as a mere irritation.

Personally, I am grateful to Lieut.-Col. Richards, Brig. Osmond, and Major Thomas for their erudition, so charmingly expressed; and to Major Thomas in particular for the savour of his wit. It may be weak and foolish, but I fancy some of your readers, like myself, prefer to read Major Thomas writing of Priapus than Dr. Gardner writing of Dr. Gardner.—I am, etc.,

Lincoln. ALLAN H. BRIGGS.

Myringotomy and Paracentesis

SIR,—The letter from my friend, Dr. J. K. Milligan (Jan. 19, p. 109), calls for some comment. He alludes to myringotomy as "cutting the drum." It should, of course, be the drum-head or membrane; the drum is a cavity, the tympanum. The membrane corresponds to the parchment cover of the ordinary musical drum.

Having "little Latin and less Greek" I have sought the help of my classical friend, Mr. J. F. Burns, in discussing the classical names. He tells me that "myringa," although it sounds like a Greek word, is unknown to Greek scholars, and the *Oxford Dictionary* says it is a modern Latin word. We may, I think, leave this point with the definition of "myringotomy" as "incising the tympanic membrane."

The name "paracentesis" presents more difficulties as it has acquired an additional meaning in later years. It is used for sucking out fluid from the chest and from the abdomen. Mr. Burns tells me that "spasma" is the word used by Aristotle for suction, but in medical Greek it is used for convulsion and therefore might be confusing if used in our desired meaning. The word "paracentesis" is firmly fixed in medical phraseology to-day. By analogy we can give it the additional meaning of sucking out when applied to an operation on the tympanum.

I conclude with an appeal that the word "paracentesis" should not be used as an alternative to "myringotomy," but should denote drawing off fluid from the tympanum.—I am, etc.,

Guildford. T. B. JOBSON.

Medical Photography

SIR,—I would like to thank Mr. Maurice Lee (Sept. 22, 1945, p. 407) and Dr. S. Watson Smith (Oct. 20, p. 548) for their sympathetic reaction to my suggested scheme for an Institute of Medical Photography, and would ask others if it is in the interest of medical photography to condemn so hastily such a scheme as absurd and utopian. The value of some recognized training centre became obvious to me when, in charge of the photographic department of an important hospital, people often asked how and where they could be *trained* in medical photography. After extensive inquiries I could find no such place, and do not think the lectures and discussions given and arranged by scientific societies, valuable though they be, will *train* a photographer; also, many doctors have asked me where they could get such specialized work done for them. This seems to me an opportune moment in which to put forward such a scheme for consideration. If I did not make myself clear or put first things first I am sorry, and ask again if the medical profession and various societies will seriously consider such a scheme before the initiative slips into the hands of a commercial enterprise, or would they prefer it that way?

There are a number of people and books ready to tell us what any photographer knows: which camera and how to use it, the lights, the material, etc., but I have not yet found one person who can successfully demonstrate to me how best to photograph a lesion tucked away under the tongue in a sore and tender mouth—something entirely different from that required by a dental specialist—or how to take photographs, over a period of time which will be measurably comparable, of a patient in various stages of ill-health whose *figure* and lesion have *both* changed quite considerably in shape and size.—I am, etc.,

London, W.1. HILDA ROBERTSON.

Memories of Clifford Allbutt

SIR,—In the summary of Sir Walter Langdon-Brown's paper on Sir Clifford Allbutt (Feb. 2, p. 174) a passing reference is made to the report that George Eliot took him as the prototype of Dr. Lydgate in *Middlemarch*. In one of the letters transcribed in Cross's *Life of George Eliot* she refers to her visit to Leeds (about 1875) when she was the guest of the Allbutts. She mentioned how greatly struck she was with the wide culture and charm of Clifford Allbutt. She was at the time working out

Middlemarch, and it is clear that the early career of Lydgate is closely paralleled by that of Allbutt. Both had studied in Paris—Allbutt under Trousseau, Lydgate under Broussais and Bichat; both had "felt the growth of an intellectual passion" (*Middlemarch*, Chap. X) and had a special interest in fevers; and both had settled in a provincial town. Whenever the subject was mentioned Sir Clifford Allbutt preserved a Sphinx-like silence. Some forty years ago he had been invited to give away the prizes at the speech day of his old school—St. Peter's, York. The chairman, the dean, had asked me for particulars as to Allbutt's career in order to introduce him to his audience. I wrote *inter alia* that his first publications had been a series of articles on Greek medicine in the *Medico-Chirurgical Review*, and finished with the words: "He is supposed to be the prototype of George Eliot's Dr. Lydgate in *Middlemarch*." At the meeting the chairman forgot his cue and, producing my letter from his pocket, read its contents. I watched Allbutt's face carefully and noted that he made not the slightest sign of assent or dissent, nor was he approachable on the subject. Incidentally he once told me that he had attended only one confinement in his life. Dr. Samuel Gee beat him in this by having attended three.

As another of those who listened to Allbutt's inaugural lecture at Cambridge in 1892 I can add my own personal testimony to that of Sir Walter Langdon-Brown as to the lasting impression and intellectual awakening which it inspired in another of his audience.—I am, etc.,

Wesco, Cumberland. G. A. AUDEN.

Obituary

GEORGE W. BRAY, M.B., CH.M., M.R.C.P.

Dr. G. W. Bray, a leading specialist in the study and treatment of allergic disorders, died at his home in Hampstead on Feb. 12. He had been incapacitated by a severe illness last year, but it was hoped that this would not recur and that a further lease of active and fruitful work was in store for him.

George William Bray studied medicine at Sydney University, graduated M.B., Ch.M. in 1925, and then left to take up the post of Government medical officer at Nauru, an atoll in the Central Pacific which is a mandated territory administered by the Commonwealth of Australia. In 1926 he came to England and was appointed house-physician and then resident medical officer at the East London Hospital for Children. His interest in allergic diseases in childhood was brought to the notice of the Halley Stewart Trustees, who nominated him asthma research scholar at the Hospital for Sick Children, Great Ormond Street. Much of the work done during his five-year tenure of that scholarship was embodied in a monograph *Recent Advances in Allergy*, first published in 1931 with a foreword by Sir Arthur Hurst, who paid tribute to the author's flair for research combined with hard toil and clear thinking. The book went into a second edition in 1934 and a third in 1937, each of them carefully revised and brought up to date. Bray also wrote papers on hay fever and hay asthma and contributed the section on asthma to the *British Encyclopaedia of Medical Practice*, under the editorship of Sir Humphry Rolleston. By that time he had been appointed assistant physician to the Princess Elizabeth of York Hospital for Children and was engaged as clinical assistant to the asthma clinic at Guy's Hospital. Continuing his work in general paediatrics he was also appointed physician in charge of the children's department of the Prince of Wales's Hospital at Tottenham, as well as physician for allergy there, and consulting allergist to the Children's Hospital at Hampstead. He had been admitted a member of the Royal College of Physicians of London in 1933 and was a member of the British Paediatric Association.

The articles by George Bray published in this *Journal* included a paper on "The Hereditary Factor in Asthma and Other Allergies," the outcome of work done with a grant from the Asthma Research Council; an address on "The Treatment of Allergic Diseases in General Practice," read before the Leicester Medical Society; and an article on asthma written in 1935 for our series on Treatment in General Practice. We were also indebted to him for a number of reviews of books on allergy and its clinical manifestations.

L. J. W. writes:

Bray was one of the original members of the Asthma Research Club, which was formed when increased attention was devoted to asthma in this country from 1930 onwards largely as a result of the activities of the Asthma Research Council. Bray had come from Australia, where he had worked in a different field. He was one of the first to recognize the importance of native foods in preventing avitaminosis in primitive peoples, in particular the native beer, which was cloudy with yeast cells. He pointed out the harm which was done by would-be reformers in depriving children of this valuable food. He was, in fact, primarily a paediatrician, and his interest in allergy grew out of the problems he was faced with in treating bronchitis and papular urticaria in childhood. He developed in this country what might fairly be called the American approach to the subject—that is to say, the careful testing of allergens and the use of specific desensitization. It became rather a joke in the Asthma Research Club that one could always predict what would happen to an asthmatic if he went to any of the specialists in the disease, and with Bray it was a full-scale and comprehensive range of skin tests. Hurst, who was the leader of the asthma research group, disliked the allergic hypothesis of asthma almost as much as the psychogenic, and Bray had to struggle to get his aspect of the subject as much space as it deserved on the map. Nevertheless he succeeded. He had a wide knowledge of the allergic diseases, and his book, *Recent Advances in Allergy*, was one of the best in a distinguished series of monographs. Coming from over-seas with no advantages or connexions, he fought his way to a large London consulting practice by pure merit. He was a typical Australian in appearance and accent, vigorous, cheerful, and unpretentious. He obviously found great happiness in his family and in the English countryside and coast. He was a lover of good cars, an unusually speedy driver in London traffic, and his skill and sardonic comments on less expert motorists brightened many a journey home after a tiring clinic. One could usually count on meeting him at the lunch room in the Royal Society of Medicine, and his premature death has left a gap both there and in the affections of a multitude of colleagues and patients.

R. C. WINGFIELD, M.B., F.R.C.P.

We regret to announce the death on Feb. 5 at Camberley of Dr. R. C. Wingfield, late medical superintendent of the Brompton Hospital Sanatorium at Frimley, whose long experience in the treatment of pulmonary tuberculosis in adults enabled him to write with authority several books and many papers and reports.

Rodolph Charles Wingfield, younger son of the Rev. Canon Charles Wingfield, of Welwyn, Herts, and Tiverton Castle, Devon, was born at Welwyn on Feb. 20, 1886, and after school-days at Haileybury entered Trinity College, Oxford, as a student of medicine. He graduated B.A. and went on to St. Thomas's Hospital for his clinical course, qualifying as M.B., B.Ch.Oxon in 1911. He then served in turn at St. Thomas's as house-physician, demonstrator of morbid anatomy, and assistant pathologist, won the Louis Jenner research scholarship, and was appointed medical officer in charge of the tuberculosis department. He took the M.R.C.P. in 1914 and was elected F.R.C.P. in 1928. The appointment to Frimley proved most congenial and he held it for a long period. His first book, *Modern Methods in Diagnosis and Treatment of Pulmonary Tuberculosis*, was written there and appeared in 1924; it was followed five years later by a *Textbook of Pulmonary Tuberculosis for Students*, a work valuable not only to medical practitioners but also to many people concerned in the prevention of tuberculosis, which gave a sane estimate of what could and could not be done for sufferers from that disease and an appreciation of the true function of the sanatorium. Another and much smaller book by Wingfield, *Pulmonary Tuberculosis in Practice: A Modern Conception* (1937), contained teachings which should help to secure both early diagnosis and the correct handling of the vast number of people suffering from phthisis in its different clinical forms. This was, in the author's words, an attempt "to bridge the gap between the practitioner and the

specialist." The excellent reasoning and sound common sense were, however, marred by a complex and confusing terminology. It appealed more to tuberculosis officers and medical officers in sanatoria than to harassed general practitioners.

A memorial service was held on Feb. 10 in the Chapel of Brompton Hospital Sanatorium, where he had worked with inspiring energy and devotion for 25 years until failing health compelled him to resign his post in 1945. Wingfield's honesty and steadfastness and his administrative skill won the deep regard of colleagues and nursing staff at Frimley; they knew that the welfare of the patient as an individual came first in his thoughts and actions.

Dr. JOHN ALEXANDER HOWARD, who practised for many years at Beulah Hill, Upper Norwood, S.E., died on Dec. 27. He was one of the outstanding students of his time at Guy's Hospital, winning first-class honours in chemistry at the preliminary science examination at the University of London, first-class honours and medal in organic chemistry at the intermediate M.B., and first-class honours in medicine and in forensic medicine at the final examination. He also won an entrance scholarship in science at Guy's in 1889, and his essay on uraemia, which won him the Treasurer's Prize in 1893, was published in the *Guy's Hospital Gazette*. Dr. Howard took the English Conjoint diplomas and the M.B.Lond. in 1893 and the M.D. a year later, after serving as house-physician and obstetric resident at Guy's. He was surgeon to the Norwood Cottage Hospital for many years, and had been radiologist to the Croydon War Hospitals. He joined the British Medical Association fifty years ago.

Dr. THOMAS RICHARD WEBSTER ATKINS, surgeon on the s.s. *Cameronia*, one of the Anchor Line ships, died in Glasgow on Jan. 10 after a long illness at sea. He studied medicine in Edinburgh and Dublin and qualified L.R.C.P., L.R.C.S.Ed., and L.R.F.P.S.Glas. in 1898. He had seen active service in the South African War, and during the war of 1914–18 he was a captain in the R.A.M.C.(T.F.). He served for a long period in the trenches, and was wounded. After some years with the Cunard White Star Line Dr. Atkins joined the Anchor Line in 1938 and was with that company all through the war of 1939–45. He was on board when his ship was hit in December, 1942, and in the New Year's Honours List of 1944 he received the O.B.E. for his war work. He joined the British Medical Association in 1919.

Dr. WALTER GUYON RICHARDS, who died on Jan. 25, was chairman in 1922 of the Lewes and East Grinstead Division of the British Medical Association, which he had joined in 1902. Born at Winchester on July 10, 1869, son of Frederick William Richards, F.R.C.S., he was educated at Lancing, at Christ's College, Cambridge, and at St. Bartholomew's Hospital. He qualified in 1893 and took the Cambridge M.B. in 1897. For some considerable time he was an officer in the Indian Medical Service, and retired with the rank of major. During part of the war of 1914–18 he was in charge of the orthopaedic and electrical department of the Kitchener Hospital for Indian Troops at Brighton. He practised for some years in Holdenhurst Road, Bournemouth, and more recently made his home in Highgate.

We record with regret the death on Jan. 27 of Mr. JAMES WILMOT ADAMS, M.B., B.Ch., F.R.C.S., for many years a surgeon in the Colonial Service. Educated at Tonbridge School, he went on to Caius College, Cambridge, and to St. Bartholomew's Hospital and qualified in 1908, having obtained honours in the Natural Sciences Tripos of 1906. He joined the Colonial Service and worked first at Malacca, then at Penang, and finally at Singapore. He served his full time and then (before the late war) returned to this country and settled at Great Gransden, Bedfordshire. His health had been impaired by residence in the East, and he died very suddenly of coronary thrombosis. He married in 1913 Irene, youngest daughter of the late James Appleyard, M.D., J.P., of Longford, Tasmania, and had two children, who, with his wife, survive him. He will be remembered at his medical school as "Bill Adams," famous on the football field.

Dr. WALTER GEORGE MACDONALD, who gave notable service to many families by founding the Glasgow and West of Scotland Prisoners of War Relatives' Association in 1941, died on Jan. 28 at his home in Dalziel Drive, Glasgow. He had studied medicine at Glasgow University, and graduated M.A., M.B., Ch.B. in 1905. After holding the posts of house-physician and house-surgeon at the Victoria Infirmary, Glasgow, he was for a time honorary medical officer of the Penrith Cottage Hospital. Dr. Macdonald served with a temporary commission in the R.A.M.C. throughout the 1914–18 war and was awarded the Military Cross. He joined the B.M.A. in 1908 and became a member of the Pathological Society. An enthusiastic card-player, he was the first president of the Scottish Bridge Union when it was founded in 1932.

Dr. ROBERT BALFOUR GRAHAM, who died at North Links, Leven, Fife, on Jan. 28, had a distinguished career and remained a member of the B.M.A. for 60 years, holding the post of secretary of the Section of State Medicine and Medical Jurisprudence at the Aberdeen Annual Meeting in 1914; he had also been president and hon. secretary of the Fife Branch. Born at Linthorne Manse in Roxburghshire on Aug. 25, 1859, son of the Rev. M. H. N. Graham, he entered the Medical School of Edinburgh University in 1880, qualified in 1884, obtained the F.R.C.S.Ed. diploma by examination in 1888, and the D.P.H. in 1894. Dr. Graham went to Leven 60 years ago; he was appointed M.O.H. for the borough in 1904, and examiner in public health for the Royal College of Surgeons of Edinburgh in 1911. He was an active worker in the St. John Ambulance Association from the year 1890 when he began as an examiner, and was later appointed lecturer and honorary life member. In the war of 1914–18 he served as senior medical officer at a Command Depot with the rank of lieut.-col., R.A.M.C.(T.), and had also been county director of the Scottish Territorial Red Cross Brigade. Keenly interested in ex-Service men's affairs he was president of the Leven Branch of the British Legion and also of the Fife and Kinross Area Council, and for some time vice-president of the National Executive of the British Legion in Scotland. He received the M.B.E. and the Volunteer Decoration, and was a J.P. for Fifeshire and a past-president of the Fife Medical Association.

Dr. FRANCES E. TURLE SAINT (*née* Turle Evans), who died in retirement at Herne Bay on Jan. 30, came of a family who had been doctors for four generations. She was the youngest daughter of Dr. Evan Evans, R.N., and was born in the City of London in 1867. She was educated at the Maria Grey School, the London School of Medicine for Women, and the Royal Free Hospital, whence she qualified L.R.C.P.&S.Ed., L.R.F.P.S.G. in 1897. As Dr. Turle Evans she was particularly interested in obstetrics and worked at the Clapham Maternity Hospital (now the Annie McCall Hospital) and its Battersea Branch until 1901, when she started private practice in Harlesden, London, N.W. There she worked hard and very successfully until her marriage in 1908 to the Rev. F. Guy Saint, Rector of Wapping, and late Rector of Great Tey, Essex. She did no regular medical work there, but continued to be an examiner for the Central Midwives Board, and in a quiet way was of immense medical help in both the town and country parishes. In 1932, on the death of her husband, Dr. Turle Saint retired to Herne Bay, and even there she continued to help and advise a young newly qualified nephew—of the fifth generation. Her death is mourned by a very large circle of friends and patients.

Dr. ARTHUR CECIL HOVENDEN of East Sheen, S.W., who died on Jan. 31, aged 76, was one of the best-known figures in the Sheen area. He was a Guy's student, and soon after taking the Conjoint diplomas graduated M.B., B.S.Lond., with honours in medicine, in 1894; six years later, after acting for a time as clinical assistant at Great Ormond Street Hospital for Children, he began to practise in partnership at Sheen, becoming senior partner in 1912. Dr. Hovenden joined the British Medical Association in 1904. In his younger days one of his greatest pleasures was a canter or a gallop in Richmond Park before breakfast. His other interest, apart from medicine, was model engineering and the study of railway literature, and he was a member of the Stephenson Locomotive Society.

The death of OGLE WOODS at the age of 70 brings to a close a long and gallant struggle against a severe and crippling disability. While a student at St. Thomas's Hospital he contracted a tuberculous kidney, for which a nephrectomy was performed. After doing various hospital appointments Woods settled in general practice at Bridgend, but some years later he was compelled to abandon this as tuberculosis of the knee developed, eventually necessitating an amputation. No longer capable of coping with his extensive general practice he turned to surgery, and with that end in view accepted the post of R.S.O. at Swansea General Hospital during the years of the first world war; in due course he secured his F.R.C.S.Ed. and subsequently received the appointments of supernumerary surgeon and also orthopaedic surgeon at that hospital, later to become a full surgeon. Woods possessed a lovable disposition with outstanding honesty of purpose, sound common sense, and great courage in surmounting his physical infirmities. These did not impair

his keen sense of humour, and often his colleagues would enjoy the sound of his laughter in the intervals of work in the theatre. He took an active part in hospital politics, and was fearless and downright in expressing his views in the board-room: his doggedness was mitigated by his eminent fair-mindedness, and was valued and liked even by his most persistent opponents; by his death his hospital has lost an outstandingly valuable counsellor. Woods did not allow his infirmities to deprive him of one open-air pastime; as a fisherman he excelled, being an expert entomologist making his own flies, and learned in the ways of trout. In spite of his artificial leg he would overcome the difficulties and rough conditions of Welsh trout streams during his scanty leisure. Recent times added to his professional labours, but in spite of advancing years, pain, and disablement, his undaunted spirit carried him on, perhaps to shorten his days, though that would never deter him. Swansea has lost a very notable man; he will not be forgotten.

H. W. G.

Universities and Colleges

UNIVERSITY OF OXFORD

In a Congregation held on Feb. 12 the name of R. H. S. Thompson, D.M., Fellow of University College, duly nominated by the Board of the Faculty of Medicine as Dean of the Medical School from Feb. 1 to Oct. 1, 1946 (vice K. J. Franklin, D.M., F.R.C.P., Fellow of Oriel College, resigned) was submitted to the House and approved.

UNIVERSITY OF CAMBRIDGE

Postgraduate Courses for Ex-Service Medical Officers

It is proposed to hold 14-day refresher courses in general medicine for medical officers released from H.M. Forces at the Southend-on-Sea General Hospital commencing April 1, and at Addenbrooke's Hospital, Cambridge, in July. There will also be a 14-day course in social and industrial medicine at Luton in May. Assistance will be given in procuring accommodation for the Southend course on application to the secretary, Southend-on-Sea General Hospital. General practitioners may attend these courses should vacancies occur. Further particulars and forms of entry may be obtained from Dr. Firth, Trinity Hall, Cambridge.

At a Congregation held on Feb. 9 the following medical degrees were conferred:

M.D.—A. C. Cunliffe, J. W. Lacey.

M.B., B.Chir.—*F. T. J. Hobday, *M. W. P. Ward, *P. K. Ledger, *J. H. Gough, *J. O. P. Edgcumbe, *J. B. Metcalfe, *P. H. Hewitt, J. E. Blundell, A. C. Elithorn.

M.B.—*C. M. Heath.

* By proxy.

UNIVERSITY OF LONDON

University College

The Professor of Anatomy, Mr. J. Z. Young, F.R.S., will give his inaugural lecture on Thursday, Feb. 28, at 5.15 p.m., in the Anatomy Lecture Theatre, with the Provost in the chair. Subject: "Patterns of Substance and Activity in the Nervous System."

UNIVERSITY OF SHEFFIELD

At a meeting of the University Council, held on Feb. 8, Charles Herbert Stuart-Harris, M.D., F.R.C.P., late colonel, A.M.S., was appointed to the full-time Chair of Medicine in the University.

The Council received the resignations of Prof. Wilson Smith (professor of bacteriology); Dr. Robert Platt (lecturer in medicine, on his appointment to the Chair of Medicine in the University of Manchester); Mr. W. J. W. Sharrard (temporary demonstrator in anatomy); and Prof. A. E. Barnes (of his academic duties), and thanked them for their services to the University.

UNIVERSITY OF EDINBURGH

In 1944 Sir Robert M'Vittie Grant made a gift to the University of Edinburgh for the foundation of a professorship of dermatology, and the University Court has now appointed Dr. G. H. Percival to this chair, which is named after the donor. The Edinburgh Medical School was a pioneer in this country in providing systematic teaching in diseases of the skin, and the new professorship is the only one of its kind established so far in Britain. The skin department of the Edinburgh Royal Infirmary was opened in 1884, and was replaced by new and much larger premises in 1936. Beyond this accommodation the municipal authorities of the city have paid much attention to the provision of beds and the organization of treatment for dermatological cases. Dr. Percival graduated in medicine in 1923, and in 1931 proceeded M.D. and was elected F.R.C.P.Ed.; five years later he was appointed a physician to the skin department of the Royal Infirmary. He has been responsible for the later editions of Sir Norman Walker's *Introduction to Dermatology*.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At an ordinary meeting of the Council held on Feb. 14, with Sir Alfred Webb-Johnson, President, in the chair, Dr. E. Ashworth Underwood was appointed Thomas Vicary Lecturer for 1946.

The Hallett Prize was awarded to Mr. Rameash Nigam of the University of Lucknow.

Sir Heneage Ogilvie and Mr. L. E. C. Norbury were reappointed as representative members of the Council on the Imperial Cancer Research Fund, and Mr. Eardley Holland was re-elected as the representative of the College on the Central Midwives Board.

Mr. Hedley Whyte, Mr. J. B. Oldham, Mr. M. F. Nicholls, and Mr. Harold C. Edwards were re-elected members and Mr. Julian Taylor was elected a member of the Court of Examiners.

Diplomas of Membership and Diplomas in Public Health were granted jointly with the Royal College of Physicians of London to the candidates whose names were published in the report of the meeting of the Royal College of Physicians of London in the *Journal* of Feb. 16 (p. 260).

The main Library of the College was not seriously damaged when other parts of the building were bombed, and the books have now been returned to the shelves. Several tons of books had been evacuated to Downton Castle, Ludlow, Alfrick Court, Worcester, and the National Library of Wales. Rearrangement of the Library is now proceeding and the Reading Room is open once more to students from all parts of the world.

Professorial lectures on applied physiology and pathology will be given on Mondays, Wednesdays, and Thursdays throughout March (Friday, March 8, in place of Thursday, March 7). The lectures on pathology will be given by Prof. R. A. Willis. The lecturers on applied physiology include Profs. R. J. S. McDowall, Samson Wright, B. A. McSwiney, F. R. Winton, O. G. Edholm, H. P. Gilding, and W. R. Spurrell. Further particulars will be issued later

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

The trustees of the Dr. James Watson Prize Fund invite applications from Fellows of the Royal Faculty to give the James Watson lecture for the year 1946–7. The subject is unrestricted but should deal with an aspect of medicine or surgery to which the lecturer has devoted special study. The lecturer's name must have been on the *Medical Register* for a period not exceeding 15 years; value of lectureship £30. Applications, indicating the proposed subject, should be made in writing to the Secretary of the Royal Faculty, 242, St. Vincent Street, Glasgow, by March 15.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

At the monthly business meeting of the President and Fellows of the Royal College of Physicians of Ireland, held on Feb. 1, M. L. Abrahamson, J. B. Ryder, and F. S. Stewart were admitted Licentiates and Members of the College.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council, held in the College House on Jan. 26, with the President, Mr. Eardley Holland, in the chair, the following candidates were elected to the Membership of the College: Constance L. Beynon, E. W. C. Buckell, W. Calvert, R. G. Cross, S. N. Gardé, Perla Greeves, Emilie E. Guthmann, W. P. Hirsch, W. Kearney, A. H. C. Walker, Margaret Weddell, May D. Westerman.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the final examinations, have been granted the diploma of L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P.& S.Glas.:

J. B. Bale, G. Brill, J. E. Burdett, E. B. Cowan, R. M. Dykes, A. F. M. El-Nomani, G. W. Farrington, J. L. Fine, Janet H. A. Fleming, A. Foreman, Hanna M. M. Girgis, W. Henderson, Mary P. Hughes, F. J. G. Kinsella, A. K. Kuta-Dankwa, Murdina Macrae, E. MacSween, Almena M. Maragh, T. A. Morton, R. A. K. Ross, E. De S. Sar, J. S. P. Wilson.

L. Seewald, a graduate of a recognized foreign university, was also admitted a licentiate.

The Services

The President of the U.S.A. has bestowed the Legion of Merit, Degree of Commander, on Surg. Rear-Admiral C. P. G. Wakeley, C.B., for distinguished services to the United States Medical Service.

Surg. Lieut. D. R. Rigg, R.N.V.R., has been awarded the Czechoslovak Military Medal of Merit, First Class, for service to the Czechoslovak Section of Warwick Hospital.

Medical Notes in Parliament

Leprosy in India

Asked on Jan. 28 whether he could give any statistics of the prevalence of leprosy in India Mr. ARTHUR HENDERSON replied that the figure given in the 1931 census (the last in which such a figure was included) was 150,000. Local surveys suggested that the real total of cases was about one million, of which only about one-quarter were at any one time infectious, some being very slight cases indeed. Existing data gave no reliable indication whether the disease was increasing or decreasing.

Venereal Disease in B.A.O.R.

Replying on Jan. 29 to Sir Waldron Smithers, Mr. LAWSON observed that it was difficult to estimate to what extent the present level of venereal disease in the B.A.O.R. was attributable to the removal of the ban on fraternization. All those concerned were fully aware of the importance of reducing the incidence of venereal disease to the minimum. All practicable steps towards this end had been and were being taken by the Army medical services.

Malaria Research Institute in Africa

On Jan. 30 Mr. CREECH JONES informed Sqdn. Ldr. Donner that a considerable amount of control and research work on various aspects of the malaria problem had been and was being done in both East and West Africa, but there was no specific institute on the lines of the Malaria Institute of India. The establishment of such an institute was one aspect of the whole problem of the future organization of medical research for the Colonies. It was being considered by the Colonial Medical Research Committee, which was set up last year under the chairmanship of Sir Edward Mellanby by the Secretary for the Colonies and the Medical Research Council.

Medical Specialists in the Services

Air Cdre. HARVEY inquired on Feb. 5 what steps were being taken to provide specialists for the medical services of the Navy, Army, and R.A.F. to replace Service specialists retained beyond their release groups.

Mr. KEY said efforts were being made through the Central Medical War Committee to recruit practitioners up to the age of 40 who were qualified to serve as specialists in the Forces. The number remaining available in the E.M.S. and civil practice was much more limited than was commonly supposed, but the committee, in consultation with its local committees, was constantly reviewing the staffs of hospitals to decide which men could be spared or replaced. Mr. Key added that Mr. Bevan had communicated with hospitals concerning the use of demobilized officers for such replacements. Short-service commissions for 18 months were being offered to both practitioners so recruited and specialists over the age of 40 who volunteered. The Medical Personnel (Priority) Committee had decided that it would be unprofitable to reopen the cases of specialists who in the past had been found medically unfit.

Aliens in the R.A.M.C.

Mr. LAWSON on Feb. 5 told Col. Harry Morris that the War Office had accepted upwards of 500 non-British doctors for service as medical officers in the R.A.M.C. during the war. The end of the war and the rapid run down in all theatres resulted in a reduction of the number of posts in which these practitioners could suitably be employed. In consequence no further appointments were being made, except in the case of those in the specialist category. Non-British practitioners already serving who had been recommended were, however, permitted to extend their service until general demobilization or for so long as their services were required.

Release of Doctors from R.A.F.

In answer on Feb. 6 to Air Cdre. Harvey, Mr. JOHN STRACHEY announced that medical officers in the R.A.F. in Group 27 would be released in February. General duty medical officers in the Army were being released up to Group 38 by the end of February, and their colleagues in the Naval medical services were being released up to Group 40. These releases all resulted from a Government decision that there should be two medical officers per 1,000 men in each of the three Services. The release of R.A.F. medical officers was at present up to the general average for the R.A.F. The Air Ministry could not go faster than this because the wartime proportion of medical officers in the Air Force had been much lower than in the Army or the Navy. He hoped for a further intake of doctors for the R.A.F. this year so that the present disparities in release could be reduced.

Nutrition in Newfoundland

The report on nutrition in Newfoundland made by a committee of experts from the United Kingdom, Canada, and the United States in 1944 and published in 1945 has been the subject of detailed study by the Newfoundland Commission of Government. A further report is expected shortly from Dr. Cuthbertson, now director of the Rowett Research Institute, who visited the island last August. The Newfoundland Government has taken steps, including the fortifying of flour and margarine, to overcome the lack of balance in the normal diet of sections of the Newfoundland people.

Atomic Energy

Mr. ATTLEE on Feb. 6 told Mr. Blackburn that little progress had as yet been made in the development of atomic energy for peacetime purposes. He hoped that the co-operation which had existed between this country and the United States in this field during the war would be continued in the future.

Treatment for Homosexuality

Mr. EDE does not think that progress will be facilitated by the appointment at the present stage of a committee to examine the use of curative or psychological treatment of persons guilty of homosexual offences. Not all persons sentenced to imprisonment for these offences are suitable subjects for psychological treatment. He agreed that the treatment should be available in all cases where there is a reasonable prospect that it will have beneficial results.

Paper for Textbooks

Mr. BEVAN said on Feb. 7 that there was difficulty in obtaining midwifery as well as other textbooks owing to the shortage of paper and printing labour. He had discussed the matter with the President of the Board of Trade, who had arranged for considerably increased supplies of paper to be made available to publishers, and for 750 printing operatives to be released from the Forces under Class B in order to ease the labour shortage.

World Food Shortage: Britain's Share

The world food shortage was debated by the House of Commons on Feb. 14. Sir BEN SMITH said the situation had been completely changed by the exceptionally heavy demand arising from the liberation of Europe, coinciding with adverse weather and poor crops in many areas of the world. Against world import requirements of more than 17,000,000 tons of wheat in the first six months of 1946, less than 12,000,000 tons would be available. Many millions of people in Europe and the Far East would face starvation. In Europe 125,000,000 people would have to subsist on less than 2,000 calories a day. In some areas large numbers would receive as little as 1,000 calories a day. There were many possibilities of further deterioration. This country might have to raise the wheat extraction rate still higher or use coarse grains as diluents in bread. He hoped it would be possible to avoid that. In rice the quantity available for export from all sources during 1946 was, at most, 3,000,000 tons, whereas the world requirements were 6,000,000 tons. Britain would not get more than 300,000 tons of ground nuts, against 600,000 tons allocated by the Combined Food Board. That represented 130,000 tons less oil. Of whale oil Britain was unlikely to get more than 100,000 tons, against 135,000 tons expected. The world sugar position was precarious, and world requirements were increasing. It was not now possible to increase the bacon ration. Cheese and starch caused him anxiety. There were favourable prospects for fruit. Oranges, lemons, and grapefruit had been made available in increasing quantities. He intended to augment British supplies of vegetables and fruit by imports. There were more shell eggs, and he had never intended to discontinue the issue of dried egg permanently. Milk supplies were better this winter than last.

In replying to the debate Mr. DALTON indicated that he did not propose to reduce the imports of tobacco or films from America.

Release Leave in Cases of Venereal Disease.—In reply on Jan. 29 to Mr. Walker, Mr. LAWSON said that men were not allowed to go home on release leave while suffering from venereal disease in a communicable form. In cases where a man had received sufficient treatment in the Army to render the disease non-communicable he was allowed to go on release leave. He was provided with a card which showed the treatment he had had and contained the address of the nearest civilian treatment centre to which he should report for advice, treatment, or observation. He was also encouraged to notify the medical officer of health of his home district of the fact that he had been furnished with such a card.

Osteopaths in a National Health Service.—Mr. J. L. WILLIAMS inquired on Jan. 25 what would be the position of non-registered practitioners of osteopathy, in regard to practice, under the new National Health Service. Mr. BEVAN said he thought he ought not to anticipate the proposals for the new service as a whole, which he hoped before long to submit to the House.

Service Patients waiting Admission to Sanatoria.—Mr. LAWSON told Major Legge-Bourke on Jan. 29 that the number of military patients in the United Kingdom waiting admission to civil sanatoria was 796. The average waiting period was 7 to 8 weeks. While waiting these patients were retained in military or E.M.S. hospitals, where they were given suitable treatment. This matter was already under consideration as a matter of urgency with the Minister of Health.

Grants for Medical Training.—Miss WILKINSON stated on Jan. 31 that up to Jan. 24, under the Further Education and Training Scheme, 130 awards had been made for training in medicine. The grants provided for maintenance and the cost of fees. All applications from men and women who appeared to be eligible under the scheme would be very sympathetically considered.

Training Nurses for the Colonies.—Mr. GEORGE HALL has commended to the consideration of Colonial Governments those recommendations of the report of the Committee on the Training of Nurses for the Colonies which relate to the development of the nursing and midwifery services in their territories and the local training of staff for those services. He has asked for reports to be furnished towards the end of this year on the progress made. He has accepted the recommendation that a nurse adviser should be appointed to the staff of the Colonial Office.

Notes in Brief

Mr. Bevan told Sir Henry Morris-Jones on Jan. 22 that there had been some complaints about the relative insolubility of some samples of British penicillin, but there had also been compiaints about some American penicillin. Supplies of British penicillin had now greatly improved in quality and in some cases were being asked for in preference to American.

Mr. John Hynd stated on Jan. 24 that permission had not been withheld for the dispatch to the British zone in Germany of a complete mobile hospital unit organized by the Paderewski Memorial Hospital in Edinburgh. Unfortunately the organizers of the unit were unable to find the Polish staff necessary for its operation. The equipment was being assembled by U.N.R.R.A. for use in Poland.

There is no restriction on the supply of penicillin to the Colonies. Their full requirements can now be ordered through the usual channels.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* acute pneumonia, measles, diphtheria, and dysentery were more prevalent; the increases were, respectively, 344, 260, 68, and 49. The only diseases with a lower incidence were scarlet fever with 69 fewer cases, and whooping-cough 64.

The number of cases of acute pneumonia increased throughout the country, the only exception being Lancashire, where the notifications decreased by 49. Large increases in measles affected two areas—Suffolk 117, and London 121; 40% of the total notifications of measles were recorded in these two counties. The largest increases in diphtheria were Lancashire 23, Yorks West Riding 13, and London 11. The notifications of whooping-cough declined for the first time this year; the largest of the local fluctuations were an increase in London of 48, and decreases in Lancashire of 28, and Middlesex 20.

Dysentery notifications were the largest since last June. A further 130 cases were reported from the outbreak in Leicestershire. The other large centres of infection were Yorks West Riding 45 (Wharfedale R.D. 16, Leeds C.B. 10), Lancashire 44, Warwickshire 29 (Birmingham C.B. 26), Northamptonshire 15, London 13, Surrey 13, Northumberland 10.

In *Scotland* rises were recorded in acute primary pneumonia 41, and scarlet fever 15, and falls in measles 23, and diphtheria 19. The notifications of diphtheria (108) are only 63% of the number at the beginning of January, giving the lowest total since mid-August.

In *Eire* the notifications of diphtheria, after falling slowly for a month, rose from 53 to 75. The cases are widespread and involve forty-one areas. In Dublin C.B. increases were recorded for whooping-cough 16, measles 8, and diarrhoea and enteritis 5.

Week Ending February 9

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,405, whooping-cough 1,253, diphtheria 477, measles 1,211, acute pneumonia 1,832, cerebrospinal fever 98, poliomyelitis 11, dysentery 337, typhoid 6, paratyphoid 8. Deaths from influenza in the great towns numbered 304.

No. 5

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Feb. 2.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1946					1945 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	71	6	40	1	2	76	7	26	9	3
Deaths		—	1				3	—		
Diphtheria	496	32	108	75	16	415	18	112	83	10
Deaths	18	—	1	1	—	4	—	2	1	1
Dysentery	407	13	56	—	—	376	45	104	—	3
Deaths				—	—				—	—
Encephalitis lethargica, acute	2	—	—	1	—	1	—	—	—	—
Deaths							1			
Erysipelas			55	8	2			56	6	2
Deaths		—					1			
Infective enteritis or diarrhoea under 2 years				23					16	
Deaths	39	3	4	7	1	66	4	8	11	3
Measles*	1,167	221	93	112	4	16,039	573	478	34	139
Deaths	4	1	—	1	—	11	—	7	—	1
Ophthalmia neonatorum	54	5	16	1	—	67	3	19	1	—
Deaths										
Paratyphoid fever	2	—	—	—	—	2	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal	1,794	128	124	35	14	1,366	90	14	23	11
Deaths (from influenza)†	297	48	40	10	8	89	8	3	—	2
Pneumonia, primary			510	28				287	32	
Deaths		118		23	17		76		26	23
Polio-encephalitis, acute	2	1				1	—			
Deaths		—					—			
Poliomyelitis, acute	13	1	1	—	—	5	—	—	—	1
Deaths		—					—			
Puerperal fever		2	22				1	20		—
Deaths										
Puerperal pyrexia‡	160	11	15	1	2	130	8	12	—	—
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,351	135	225	22	33	1,401	37	163	21	61
Deaths	1	—	—	—	—	—	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	7	—	—	3	—	4	1	1	4	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	1,265	118	93	25	4	1,502	65	110	41	17
Deaths	11	—	—	1	2	13	3	4	2	—
Deaths (0–1 year)	474	68	70	45	17	609	56	61	68	34
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	7,211	1,231	931	281	202	8,032	1105	979	389	217
Annual death rate (per 1,000 persons living)			20·5	18·0				22·2	25·1	
Live births	7,354	1,050	865	316	281	6,595	722	828	414	230
Annual rate per 1,000 persons living			17·4	20·2				16·6	26·7	
Stillbirths	214	28	32			199	14	32		
Rate per 1,000 total births (including stillborn)			36					37		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

Medical News

Members of the B.M.A. are reminded that the Association possesses a small collection of volumes presented to it by the Worcester Medical Society and named after the founder of the Association, Sir Charles Hastings. It is of historical interest and has recently been catalogued. It may be seen by any member on application to the librarian.

At the meeting of the Royal Statistical Society on Wednesday next, Feb. 27, at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C., Prof. Major Greenwood, F.R.S., will read his paper on "The Statistical Study of Infectious Diseases."

At a meeting of the Medico-Legal Society to be held at Manson House, 26, Portland Place, W., on Thursday, Feb. 28, at 8.15 p.m., Dr. Letitia Fairfield will read a paper on "The Supernatural in the Law Courts, with Special Reference to the Witchcraft Act, 1735." Members may introduce guests to the meeting.

At a meeting of the Association of Austrian Doctors in Great Britain to be held on Feb. 28 at 7.30 p.m., at 69, Greencroft Gardens, N.W.3 (near Finchley Road Station), Lieut.-Col. James Marshall will speak on modern treatment of venereal diseases. Guests will be welcome.

A whole-day conference of the Nutrition Society will be held at the London School of Hygiene and Tropical Medicine (Keppel Street, W.C.) on Saturday, March 2, beginning at 11 a.m. The general subject for discussion is "Nutrition in Colonial Territories" and the following papers are to be communicated: Dr. B. S. Platt, The Problem and Principles Underlying its Solution, followed by Ministry of Information film "To-day and To-morrow"; Dr. H. S. Stannus, Malnutrition in Colonial Territories; Dr. N. C. Wright, Relation of Animal Husbandry to Human Nutritional Needs; and Dr. Audrey I. Richards, Sociological Factors. The discussion will be opened by Mr. A. J. Wakefield and Prof. R. Firth. Non-members are only admitted to meetings of the society by the introduction of a member, the meetings are private, and no unauthorized account may appear in the press. Further details of the society may be obtained from the honorary secretary, Dr. Leslie J. Harris, Nutritional Laboratory, Milton Road, Cambridge.

The annual dinner and general meeting of the London Irish Medical Golfing Society will take place on Thursday, March 7, at the Charing Cross Hotel, Strand, W.C.

The annual general meeting of the Society of Public Analysts and Other Analytical Chemists is to be held at 5.15 p.m. on Friday, March 8, at the Chemical Society's Rooms, Burlington House, Piccadilly, W. Immediately after the transaction of business Dr. J. H. Quastel, F.R.S., will give a lecture on "Biochemistry of Soil." The Council would welcome the presence of members' wives and friends at the address, which will begin about 6 p.m.

The Ministry of Health announces that a demonstration by ex-Service physical training instructors will be given on Friday, March 8, in the rehabilitation department of the Pinderfields Emergency Hospital, Wakefield. It is to be watched by the Lord Privy Seal (Mr. Arthur Greenwood) and representatives of Government Departments, local authorities, and hospitals. The instructors who are giving this demonstration are undergoing a six-months course organized by the Ministries of Health and Labour. During the war a number of physical training instructors from the Services were attached to emergency hospitals to help in the rehabilitation of patients. Their work was so successful that the Ministry of Health is anxious to retain their services now that they are being released from the Forces. About 150 of these instructors have been selected for this special course, in order to qualify them as remedial gymnasts. They will then be available for posts in hospital rehabilitation departments, special rehabilitation centres, industrial health centres, etc.

The January/February number of *Industrial Welfare and Personnel Management*, published by the Industrial Welfare Society, 14, Hobart Place, Westminster, S.W.1, includes an article by Dr. T. M. Ling describing the work of Roffey Park Rehabilitation Centre, where indeterminate cases of ill-health arising from industry are treated; also a note by Dr. G. H. Gange, giving particulars of the annual cost of the medical department of the Glacier Metal Co., Ltd.

The following members of the honorary medical staff of the National Hospital, Queen Square, who were on active service, have now taken up their duties again: Brig. G. Riddoch, Air Vice-Marshal Sir C. P. Symonds, Surg. Capt. Macdonald Critchley, and Air Cdre. D. Brinton.

In the Cathcart Division of Glasgow by-election Mr. J. Henderson (Cons.) was returned with 13,696 votes; Mr. A. B. Mackay (Soc.) polled 9,689; and Dr. W. O. G. Taylor (Scottish Nationalist) 2,700.

Dr. Frederick Dillon has been appointed physician to the Department of Psychological Medicine at University College Hospital.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 2111. TELEGRAMS: *Articulate Westcent, London.*

MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 2111. TELEGRAMS: *Medisecra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

ANY QUESTIONS?

Inheritance of Retinitis Pigmentosa

Q.—*A woman of 26 was found to have retinitis pigmentosa about four years ago. There is no history of the condition having been present in any of her forbears. The fundus shows the changes typical of the condition, though the vessels are, as yet, little affected. While she has been under observation the peripheral field had progressively shrunk until now it is down to about 20 to 30° all round, with an isolated patch of vision temporarily in each eye. (1) If she marries and has children what are their chances of being similarly affected? (2) How long is she likely to retain sufficient vision to continue the practice of her profession?*

A.—From the genetic point of view this patient is exactly comparable with the one mentioned in "Any Questions?" in the *Journal* of Nov. 24, 1945 (p. 752). Dominant inheritance is rare and is ruled out because the disease was not present in her forbears. Sex-linked inheritance is also rare and is ruled out by her sex. Apart from the possibility mentioned below this patient doubtless owes her condition, as do the great majority of sufferers from retinitis pigmentosa, to a recessive gene. Unless she proposes to marry a blood relative the chance that her husband will be a carrier is remote, and only if he is a carrier can affected offspring appear. Thus the odds against any child being affected are some hundreds to one, and there is no genetic reason why she should not marry and have children. It is true that her children would be carriers and that in some future generation the abnormal gene might again meet its like. But this is no reason for refraining from marriage. In all probability most of us carry at least one such undesirable recessive, the only difference being that she knows it and we do not. The question does not state whether any brothers or sisters are affected. If not it is possible that the case is sporadic and may not be hereditary at all. This possibility strengthens the already very strong case for marriage and children if she desires them.

The ophthalmological prognosis is a much more difficult question. The disease is very variable in its course. Good features in this instance are the normality of the retinal vessels and the absence, presumably, of atrophy of the disks. The recent shrinking of the fields is, of course, an unfavourable indication. Retinitis pigmentosa is not necessarily a relentlessly progressive disease; it may become relatively stationary at any time. And it need not end in blindness; many sufferers retain a useful amount of vision through a long life. This patient should be advised to carry on and hope for the best.

Causation of Facial Tic

Q.—*An educated young woman of about 30 had schizophrenia three years ago, cured by drug treatment. For the last two years she has been well, but a facial tic, which she has had since childhood, appears to have become worse, especially when she is in company or excited, or when absorbed in reading or in listening to music. At such times her mouth twitches violently, and in a way that is disfiguring. Would it be safe to speak to her about this, with the suggestion that she should try to control it. Might drawing attention to this defect have untoward effects? If so, is any other line of action indicated?*

A.—Although this is obviously not a mere reflex spasm, it is often found that there is some slight local irritation—e.g., an unerupted molar, or chronic middle-ear discomfort—so that when the patient is emotionally "worked up," as in the instances given, the energy tends to discharge itself in the focus of irritation, and that in an exaggerated manner. This tic, however, may be a neurosis from childhood, which may be precipitated by emotional problems; a talk with her about any present-day worries might help. The most common psychological cause is a frustrated or suppressed assertiveness. But these problems may be of too deep a nature to discover except by analysis. In either case we can see no harm in mentioning the matter to her in a matter-of-fact way. If the first explanation

is correct it may help her to control and "canalize" her energy for proper use. If the second, it would be an introduction to a discussion of the possible worries underlying it. But perhaps the simplest, and possibly correct, diagnosis is that she had a previous slight displacement of a vertebra from a fall (which sometimes even an *x*-ray investigation cannot detect), and that this was accentuated by the drug treatment, especially if that were of the convulsive type. A manipulative surgeon might put it right.

Diagnosis of Syphilitic Kidney

Q.—*An elderly male patient with gross oedema, impaired renal function, and a positive W.R. and Kahn, admits to no previous disease. How can one differentiate between a second-stage nephritis (or a nephrosis) and a "syphilitic kidney"? What are the treatment and the pathology of the latter?*

A.—Syphilis of the kidney is rare, and impaired renal function coupled with a positive W.R. and Kahn does not necessarily indicate a syphilitic nephritis. The best method of differentiating a second-stage nephritis from a syphilitic kidney is the therapeutic test. A syphilitic nephritis should be treated with neoarsphenamine, in small doses at first, increased later. Bismuth may be employed as well, but with care. It is possible that penicillin might be effective, but no record of its use in such a case is known. Syphilitic nephritis may be early or late and may be classified as follows: *Early*—(1) acute glomerular, showing little albumin and numerous red blood cells in the urine; (2) acute tubular, the urine containing very large amounts of albumin with granular, hyaline, and fatty casts. *Late*—(1) chronic glomerular nephritis; (2) chronic interstitial nephritis—both these with a small contracted kidney; (3) chronic parenchymatous nephritis, with a large pale kidney. It cannot be stressed too strongly that a positive W.R. and Kahn do not necessarily indicate the presence of syphilis, particularly in the Tropics.

Penicillin in Bronchiectasis

Q.—*Is penicillin of any value in the treatment of old bronchiectasis in a patient unsuitable for operation?*

A.—The sputum produced by the type of case mentioned usually contains a very varied flora, including *H. influenzae* and *F. fusiformis* as well as *Str. viridans*, non-haemolytic streptococci, and pneumococci. Many of these organisms will be found to be penicillin-sensitive, but a concentration up to 2 units per ml., will usualiy be necessary to inhibit all of them. The concentration in the sputum after the intramuscular injection of penicillin never reaches the necessary level, and therefore is of little use. Local treatment must necessarily be undertaken and is most conveniently given by an inhaler. A solution of penicillin of 10,000 units per ml. is used and the patient inhales during the day for five minutes each hour. The length of time of inhalation should be increased until the sputum contains a concentration of about 5 units per ml. of penicillin; it may then be sterile. Alternatively, penicillin solution, 10,000 units per ml., may be injected into the trachea by the same technique as for a bronchogram; 5 ml. of solution should be used each day for ten days.

Irradiated Blood

Q.—*Has any work been done on the irradiation of transfusion blood in the treatment of rheumatism and allied conditions?*

A.—Irradiated blood has been used for a great variety of diseases, including arthritis. The usual procedure is to expose the citrated blood to ultra-violet irradiation; special apparatus has been devised for the purpose. It is probably little more than an elaborate form of protein shock. The literature is summarized in *The Blood Bank and the Technique and Therapeutics of Transfusions*, by R. A. Kilduffe and M. de Bakey (London, 1942, pp. 133, 134).

Rh Antigens

Q.—*In an article on irregular haemagglutinins after transfusion, Callender and Pavkoç (Jan. 26, p. 119) mention the six Rh antigens included in Fisher's scheme. What is this scheme, how many Rh antigens are now recognized, and what are they? What is the significance of the letters CDe, cDE, and cde used after Rh_1, Rh_2, and rh, respectively?*

A.—When Fisher's theory was proposed in 1944 it provided rhyme and reason for the rather bewildering Rh antigen-antibody reactions then known. It also made certain predictions which are gradually being verified. According to this theory three adjacent genes are responsible for the Rh blood-group antigens, not one gene as had been previously supposed. Each of these genes has at least two alternative forms, called *C* or *c*, *D* or *d*, and *E* or *e*. Each chromosome must carry three genes, which may be *CDE* or *CDe* or *cDE*, etc. As an individual has two of each of the 24 different human chromosomes he will have two of the Rh chromosomes, and each may carry any combination of the three alternative pairs. For example, a person may have received *CDe* from one parent and *cde* from the other. This particular combination—*CDe/cde*—is common in Britain and the U.S.A. The six Rh genes produce six corresponding antigens on the red cell, each capable of inducing a corresponding antibody. (This must be qualified by saying that *d* at present represents only the absence of *D*. A year ago *e* denoted only the absence of *E*, but the discovery of an anti-*e* serum, predicted some time before by Fisher, makes it possible to recognize *e* as an antigen.) Not counting *d*, there are six Rh antigens—*D*, *C*, *c*, *E*, *e*, and C^w (C^w is a third alternative to *C* or *c*, only recently discovered)—which can be identified by positive tests. There is every reason to suppose that *d* will eventually become recognizable as a positive character.

Rh, is the original name of the "gene" which, according to Fisher, actually consists of a short strip of chromosome involving three genes—*C*, *D*, and *e*. Similarly $Rh_2 = cDE$; $rh = cde$; $Rh_0 = cDe$; $Rh' = Cde$; $Rh'' = cdE$; $Rh_z = CDE$; and $Rh_y = CdE$ (Rh_y has not yet been isolated). These earlier names are often convenient—for example, the genotype *CDe/cDE* is usually called Rh_1Rh_2, or R_1R_2. The combinations involving C^w have not been given Rh names. Successful detailed prediction, such as that achieved by Fisher, must be rare in biology. A letter about the theory appeared in *Nature* for Jan. 12, 1946 (p. 48).

Blood Urea and Blood Uric Acid

Q.—*Is the blood uric acid raised in azotaemic nephritis? To what extent is the blood urea increased in cases of a gouty diathesis with a raised blood uric acid? How should one estimate renal function in a case of gout?*

A.—The blood uric acid is raised in azotaemic nephritis when renal failure causes retention in the blood of other potential urinary constituents, such as urea. The normal blood uric acid level of 1.5 to 3.5 mg. per 100 ml. may rise to 20 or more, an extreme level being about 30 mg. per 100 ml. (Fishberg, A. M., *Hypertension and Nephritis*, 1939, p. 40). In gout the blood urea is raised only in renal failure, whereas the blood uric acid may be raised when renal function is otherwise normal.

Renal function can be estimated in gout in the following way. If the twenty-four-hour urinary volume is 600 ml. or more and the kidneys can concentrate any single specimen of urine to a specific gravity of 1020 or over, the concentration being encouraged if necessary by a twelve-hour fast, then there is no significant general diminution of renal function no matter what the level of the blood uric acid. Only if the concentrating ability of the kidneys is defective, or the urinary volume is deficient, according to these criteria, is it necessary to estimate the blood urea to learn if retention of potential urinary constituents is occurring.

"General Debility"

Q.—*How can so-called "general debility" in the ordinary working-class patient be tackled so as to get the quickest recovery?*

A.—The family doctor best serves his working-class clientele by patiently attempting to discover the cause of this "general debility." Common disorders, such as anaemia, tuberculosis, new growth, cardiovascular or renal disease, involutional depression—all productive of general debility as a presenting symptom—must be excluded or, if discovered, treated. The doctor must decide what investigations are necessary and justifiable. Minor physical disorders, such as varicose veins, painful feet, prolapse, haemorrhoids, and skin disorders, discovered in the general examination should be treated, since they may have importance as contributors to debility. These things having been accomplished, it is probable that the causes of debility in 10 to 20% of working-class patients will have been revealed. The remaining large majority can be classified thus:

(*a*) *"Poor Frails."*—By constitution or by lifelong habit. Encouragement, tonics, and sedatives for decent sleep are the appropriate remedies.

(*b*) *Psychological Disorders.*—Mainly anxiety states, hysterias (usually chronic, and eradicable only by the expert, if then), depressions, and obsessional states. Mild anxiety states may be treated by listening and by advice; and may be relieved, if the anxiety is about health, as commonly happens, by examination and investigation. Severe depressions should be referred to the expert. Obsessional disorders are usually missed in diagnosis—they lie so near to the average personality of the English and the Scots—and they commonly produce fatigue. Mild cases may be given a holiday with benefit, and persuaded to better courses.

(*c*) *Environmentally Induced Debility.*—The causes are legion. They include domestic stress, tensions at work, sex troubles, bad habits of feeding and hygiene, inadequate recreation, and so forth. Thoughtful and emphatic advice will sometimes work a miracle in this group.

(*d*) *Tired Folk.*—Especially the devoted mothers getting to middle age. These are badly short of rest and appreciation—large amounts of both should be provided.

In all four groups it is notable how good a therapeutic result is obtained by the exhibition not of nux vomica but of the doctor's ready interest.

Sulphonamide Prophylaxis of Pneumonia

Q.—*Sulphonamides and penicillin are useless against the virus of influenza, but would there be any point in using, say, the former prophylactically against secondary infections? Would it, for example, have any effect on the mortality from pneumonia?*

A.—We know of no statistical evidence that the frequency of pneumonia complicating influenza is reduced by prophylactic sulphonamide treatment, although this result is certainly to be expected. There has been no epidemic in recent years in which pneumonia appeared often enough for such proof to be feasible. In an epidemic, the higher the incidence of pneumonia the more clearly would treatment aimed at its prevention be indicated. For fairly mild and usually uncomplicated influenza—the kind we are seeing now—the routine administration of sulphonamides is not indicated. In *The Medical Use of Sulphonamides* (M.R.C. War Memo. No. 10, 2nd ed.) the verdict on this controversial question, applying also to bacterial infections complicating measles and whooping-cough, is: "Experience favours the giving of the drug at the first signs of secondary fever, rather than as a routine prophylactic in every case."

INCOME TAX

Demobilization and Income Tax

The system under which income tax is deducted from officers' pay is briefly that a central office, that of the income-tax assessor for the Service Department concerned, is responsible for deciding what allowances and reliefs an officer is entitled to and instructing the paying officer accordingly. Bearing in mind the fact that the three Services have been scattered all over the globe and are liable to transfer from one theatre of war to another, it is inevitable that serious difficulty must often arise in the task of seeing that the correct amount of tax has been deducted from pay by the time the last payments have been made. Press comment suggests that in some cases serious hardship may be caused by too drastic attempts to recover after demobilization arrears of tax caused by inadequate deductions during service.

The legal position is that the Service pay is assessable by the departmental authority and not by the local Income Tax Commissioners, but the assessments may be made after the termination of the service. In such circumstances, however, there appears to be no essential reason why hardship should be caused; the assessor for the Department concerned can arrange for formal notice of the amount due to be given to the demobilized officer, and collection can presumably proceed with proper regard to the officer's financial circumstances. Judging from references in the press the suggestion is that hardship is apt to arise where the authorities exercise their right, under the Regulations governing the "Pay-as-you-Earn" system, to recover the amount under-deducted by manipulating the "code" applicable to the subsequent civil earnings of employment. It may be of interest to see how this works in practice so far as available information suggests.

Reference was made above to "the correct amount of tax" to be deducted from pay, but in fact there is strictly no specific sum which alone is "correct." A taxpayer is entitled to certain allowances for the financial year, but there is no obligation on the authorities requiring them to spread the total of those allowances equally over the 365 days of the year, and that fact gives a certain elasticity to the assessor's calculations. Suppose, for instance, that an officer's pay ceases two months after the opening of the financial year—e.g., on May 5—and that during those two months he drew £80 in taxable pay and suffered no deduction therefrom. The departmental assessor can, if he chooses, regard that £80 as set off against £80 of the allowances due to the officer, thereby justifying the non-deduction of tax from the pay. In such a case there will be no "arrears," but it follows that tax on the civil earnings will be proportionately higher than it would have been if the £80 had not been absorbed by the two months' pay. That is no doubt a simple and unlikely case, but it illustrates how insufficient deductions during service may react on the deductions to be made from subsequent earnings of civil employment. The converse can, of course, occur; excessive deductions during service should in such cases either be rectified by a refund made direct or produce lower deductions from civil earnings than would otherwise be made.

If a demobilized officer has reason to think that the action, or inaction, of the Department concerned is imposing unreasonable hardship on him or that he has suffered excessive deductions for which redress has not been arranged by one means or another, he would be well advised to request the departmental assessor for a full statement of his tax position, so that he may be satisfied that that matter has been correctly and finally closed.

First Purchase of Car

R. C. has to purchase a car to start work as an "assistant with a view to partnership." Can he claim any deduction?

*** Only the 20% initial allowance under the Income Tax Act, 1945, plus (while he acts as an assistant, or in any case after April 5, 1947) the depreciation allowance of 25% on written-down value.

LETTERS, NOTES, ETC.

Disseminated Sclerosis: A Request

Dr. DOUGLAS MCALPINE (Department for Nervous Diseases, Middlesex Hospital) writes: At this hospital a special inquiry into the past history of patients suffering from disseminated sclerosis is being made in the hope that some light may be thrown on the aetiology of this disease. Cases of less than five years' duration are particularly required. The co-operation of general practitioners in the London area would be appreciated. Cases will be seen during a special out-patient session on Friday afternoons by appointment only (Ring MUSeum 8333, Ext. 310).

Coccygodynia or Proctalgia?

Dr. F. M. ROSE (Preston) writes: Dr. T. Astley Cooper (Feb. 2, p. 192) describes a case of what is obviously proctalgia fugax. I cannot find that a reference is made to this condition in Price's *Medicine*, but there is a short note in the *Encyclopaedia of Medicine*, volume X, page 519. The cause of the pain felt over the coccyx is spasm of the levatores ani. I was unacquainted with the condition until I developed it myself, possibly 15 years ago. The pain is probably more in the lower sacral than in the coccygeal area, is usually nocturnal, and is associated with some degree of constipation. Typically it begins as a dull ache which may cause a confused dream, and eventually the victim wakes. He lies for a few minutes hoping that it will pass, but is always forced to go to the lavatory and may pass a small scybalous mass. At this stage the pain grows in intensity and is generally associated with crampy pain over the sigmoid. After some minutes flatus and perhaps a small amount of faecal matter of normal consistency is passed and the pain gradually passes off, leaving the now relieved sufferer very pale and shaken. The condition is not very common, and I can recollect only two or three cases of patients and one of a colleague. One factor in the causation may be the taking of saline aperients on retiring.

Dr. W. B. HOWELL (Brenchley) writes: The condition noted by Dr. T. Astley Cooper suggests that which has been described by several authorities, including the late Sir Arthur Hurst, in recent years. It has been given the name "paroxysmal proctalgia" or "proctalgia fugax." Having experienced several such attacks personally since a severe attack of bacillary dysentery (Flexner) in India four years ago, I imagine that the pain is really a localized ring of spasm in the rectum. I agree that the pain, although vague in distribution to start with, eventually becomes localized in the region of the coccyx; it quickly reaches an agonizing intensity, occasionally accompanied by profuse sweating and breathlessness, and quickly subsides with the passage of a small amount of flatus. This latter phenomenon, I think, supports the rectal spasm as the origin of the pain. Sigmoidoscopy after an attack revealed nothing in my own case but the rather glazed appearance of the rectal mucosa which, I understand, is a common finding after bacillary dysentery. Several writers have noted varying precipitating causes for the condition, such as excessive smoking, threadworms, coitus interruptus, masturbation, etc. Personally, I have noticed that all my attacks have come on after a period of overwork and anxiety, and always at night. Various remedies have been suggested, such as rapid inflation of the rectum with air or water from a Higginson syringe, 3-minim (0.18 c.cm.) chloroform vaporoles, or amyl nitrite capsules. One patient has obtained instantaneous relief by swallowing glucose. Another has found that abstaining from tobacco cures the condition. If an attack follows coitus interruptus or masturbation the cure is obvious. It is important to exclude local disease in the pelvic colon, rectum, and anal canal, so that full reassurance can be given. Without this no other treatment is likely to be successful, as the pain is so unlike any other sensation that one is certain, when first experienced, that this must be the pain of a cancer. I have found that small nightly doses of phenobarbitone or butobarbitone, especially during periods of anxiety, do much to ward off the attacks.

Journals for Hong Kong

Dr. P. S. SELWYN-CLARKE, Director of Medical Services, Hong Kong, writes from the White House, Albany Street, London, N.W.1: I am greatly indebted to you for having published my appeal for medical journals for Hong Kong in your issue of Feb. 9. The response has been so very generous that an adequate number have already come to hand. Until it is possible for me to make individual acknowledgment of these gifts, may I thank the donors very warmly through your columns on behalf of my colleagues in Hong Kong.

Correction

Prof. R. A. PETERS, M.D., F.R.S., writes to point out two slips in the leading article on "BAL" published on Feb. 16. On page 241, line 20 of the first column, it should be "no monothiol or *dithio* compound." A dithiol compound is not the same as a dithio compound. Secondly, in the same column, line 14, the reference should be "Peters, *Sinclair*, and Thompson," instead of "Peters, Stocken, and Thompson."